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THE IRON AGE

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. . . THE IRON AGE . . .

SEPTEMBER 22, 1938

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Old Masters and New Ones

A FRIEND of mine is a great admirer of the past. He is one of those chaps who believes that a man's achievements are hardly worth mentioning unless the man has been dead and buried for several centuries.

The other day this friend was talking about the old masters. Michelangelo, Rubens, Van Dyck and others. "Where can you find the equal of these men today?" he asked. "Nobody in our time can begin to equal their work."

"Whom did they work for?" I asked, whereupon my friend waxed indignant. "They worked for themselves and for posterity," he said. "For themselves through the joy of artistic creation and expression and for posterity through the appreciation of their work."

"All very well," I replied. "But that did not benefit many of their own generation. Posterity, so far as their own times were concerned was non-existent. The fact of the matter is that these old masters worked for themselves and for some rich patron and his select circle of friends. As a matter of reality the patron was the master in these cases and the so-called 'old master' a laborer who worked for his daily bread."

I said this not to depreciate the work of the great artists of the past but to get this friend of mine to appreciate the work of the "new masters."

"Take Henry Ford as an illustration," I suggested. "Perhaps by the time posterity comes around the corner, it will not think any more of the V-8 than it will of the Model T. And it will not flock to art galleries to see reproductions of either one of them. Personally, I doubt whether Henry Ford as an automobile maker gives a damn for posterity. But he has furnished reliable and improved transportation to a good many millions of his contemporaries."

"Think of that, my friend," said I, "when you are tempted to decry the modern age of mass production. The old masters served at best just a few patrons who had money enough to buy most anything that they wanted, including the works of old masters. The new masters of today, the men who have built and are operating mass production industries, are serving millions of people — enabling millions to possess, to enjoy and to profit by things that they could not have had otherwise."

These new masters do not live in the past, nor in the future. They believe that posterity will be well served by posterity. But they know that posterity cannot serve those now living.

J. H. VanDeventer

Italian Plant Features High Frequency Furnaces

By DR.-ING. M. KAUCHTSCHISCHWILI

THE works of the Cogne company, Aosta, Italy, at which large, new high-frequency furnace plants have been set up, are located about 85 miles from Torino and 30 miles from the highest Alpine Mountain, Montblanc. Coal is obtained from a company mine in Thuile, located 6340 ft. above sea level, and ore from deposits over Cogne village, at an altitude of 8850 ft. Thanks to the large quantities of water coming down from Montblanc mountain, the local industries have available cheap electrical energy for metallurgical purposes.

The works at Aosta are distinguished, above all, by the fact that electrical energy is being used at all stages of iron and steel making. Thus, pig iron is produced not only in blast furnaces, but also in a novel electric low-shaft furnace. After the construction of additional electrical furnace units, it is expected that they will completely supersede present conventional blast furnaces.

The pig iron first is transferred into a mixed, also heated by electrical energy, and later on, into a converter in which it is blown. Thereupon, the largest part of the steel is transferred into electric arc furnaces to be converted to high grade steel by the duplex process.[1]

The new high-frequency furnace plant consists of four furnace units, having capacities of 8 tons, 6 tons, 1760 lb., and 330 lb. This plant is subdivided into two independent groups fed in each case from a generator aggregate and a condenser battery. Within each of the two groups, the two furnaces operate alternately in that one furnace stands ready, completely relined so as to be used without interrupting operations in the event that the other furnace crucible should be in need of repair. The second furnace of the larger furnace group has a capacity of 8 tons to work up chiefly the hot charge from the electric arc furnaces available, or to enable the handling of larger solid charges in a single melting operation.

The 6 and 8-ton furnaces belong to the largest ones of their type hitherto built in the world. This is true both in regard to the capacity and the generator output, the latter being 1750 Kw. at the motor and 1600 to 1650 Kw. at the generators. The two furnaces were built by Siemens & Halske A. G. Department for Electrochemistry, in accordance with Ajax-Northrup patents and Siemens patents. Inside of Germany, six similar units recently have been furnished for well known steel makers. This is the best indication of the rapid development of the high-frequency furnace in regard to increased output and furnace capacity.

The high-frequency furnaces of the Cogne works are primarily destined for the production of special steels such as tool steels, high speed steels, stainless steels, and various other alloy steels. The raw materials used are chiefly scrap accruing at the plant itself in the form of crop ends, turnings, etc.

For the time being, the crucibles are made of acid material. However, the intention is to change the basic linings in the near future; the latter have proved highly satisfactory in the smaller furnace units, having capacities of 1760 and 330 lb., and consequently will be used in similar manner in the large furnaces.

Among the many advantages afforded by the use of high frequency furnaces, their special suitability for yielding absolutely pure, high grade products is of paramount importance; further, their almost instant readiness for operation, the convenient regulation of the output, ease of operation, cleanliness and orderliness in use and also the high degree of economy are likewise favorable characteristics. This holds good not only for the operating cost proper which is only from 60 to 70 per cent of that of electric arc furnaces, in view of the absence of electrodes, the simplicity of opera-

[1] The arc furnace for pig iron production is rated at 12,000 Kva., and the steel melting electric furnaces for the duplexing have capacities of 20 tons each.

tion and inexpensiveness of the lining, but also in regard to the savings in valuable charging material which latter suffers practically no loss of metal due to burning.

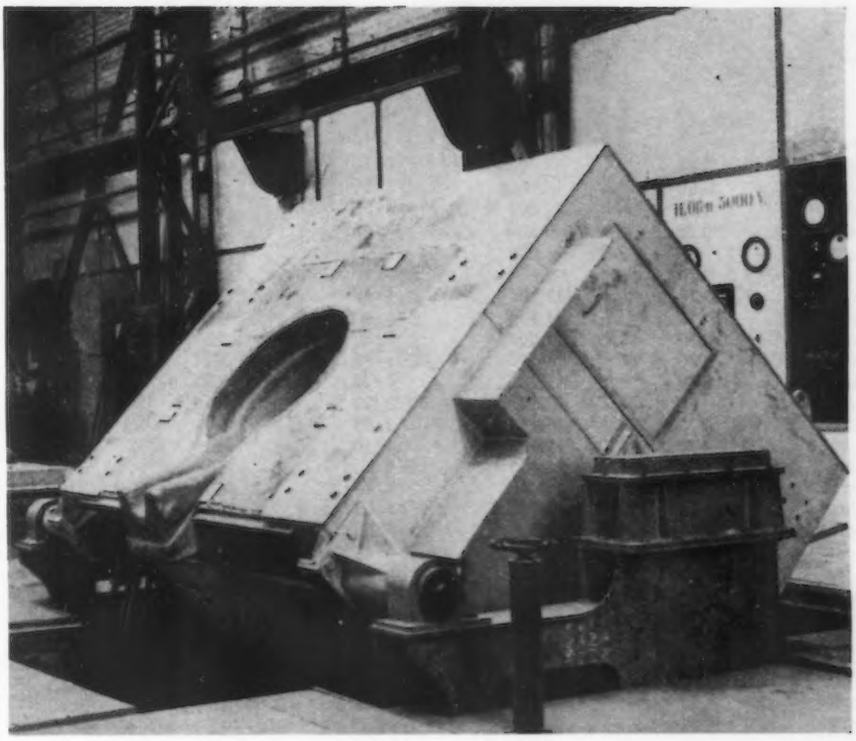
The accompanying two tables show data on two complete crucible campaigns as obtained under practical operating conditions.

Table I relates to the 6-ton high-frequency furnace and the operating period from Dec. 26, 1937, to Jan. 5, 1938. During this time, 48 heats were made, Nos. 34,653 to 34,700.

A similar possibility did not exist with Table II, covering operating data for the 8-ton furnace; only the total energy consumed is shown. To compare the two furnaces, the energy consumption has been calculated per ton, as total consumption with no division into melting and refining.

The tables have been assembled so as to show the carbon content for each heat. However, inasmuch as the steels melted were in all cases special steels containing various alloying elements such as chromium, nickel, tungsten, vanadium, etc., the carbon contents afford only approximate clues for an estimation of the melting point. Inasmuch as the author is not authorized to give further details on the heats, the indication of the carbon content will have to suffice. Additional operating data for the furnaces are shown in Table III.

When calculating the average energy consumption per ton of steel melted, in both cases, the values relating to the first two charges were left out of consideration in view of the necessary heating-up of the furnace; the average values, in Table I, cover only 46 heats instead of 48 heats, and in Table II, 50 heats instead of 52 heats. In both cases, the energy consumption values per ton of steel produced are practically of the same order; more specifically they are 670 Kw-hr. per ton with the 6-ton furnace and 679.5 Kw-hr. per ton with the 8-ton furnace. Taking into consideration that the average heat lasts 3 hr. 36 min. with the 6-ton furnace, and 4 hr. 37 min. with the 8-ton furnace, i. e. one hour longer than with the 6-ton furnace, the result must be regarded as extraordinarily satisfactory. In spite of the fact that the duration of the 8-ton furnace heat is 25 per cent higher, the energy consumption figures have remained practically constant in that it has increased only by 1½ per cent. Generally speaking, it could be expected that the energy consumption would be lower with a larger furnace. As a natural preliminary condition, in this case, the energy input is correspondingly higher with the larger furnace. In the case at hand, however, both furnaces are alternately operated from the same generator aggregate.



THE new 8-ton high frequency furnace at the Cogne works, Aosta, Italy, one of the largest units of this type in the world. Currently acid lined, this furnace will soon be changed to a basic lining.

o o o

The maximum input of the furnaces, in both cases, was 1500 Kw. As has already been stated, in spite of the considerably longer duration of the heat in the 8-ton furnace, the energy consumption as compared with that of the 6-ton furnace, being 679.5 Kw-hr. per ton has remained practically unchanged while with individual heats it was as low as 575 Kw-hr. Several heats required 605 Kw-hr. per ton; the maximum energy consumption was 745 Kw-hr. per ton, if the two first heats are not taken into consideration.

With the 6-ton furnace (Table I), the average energy consumption is 670 Kw-hr. per ton; in one case, the consumption dropped to 575 Kw-hr. per ton, while the maximum energy consumption was 780 Kw-hr. per ton.

The data on the operation of the plant as given here relate to the initial period after its erection. It is to be expected that after the workmen have acquired more experience, and after some important conditions such as a high "filling factor" of the charge, thorough covering-up of the heat, suitable wall thickness of the furnace crucible which in turn governs the "magnetic coupling" and hence, the power input, are more closely observed, it will be possible further to lower the energy consumption. At the same time, the melting efficiency of the furnace will be increased. The following data are to give an idea of the furnace loads and the generator voltage with the 6 and 8-ton furnaces:

If the duration of the heats, with the 8-ton furnace, is to be reduced by one-third, inasmuch as under the prevailing conditions, it is about 4½ hours, it is necessary to increase the input by a corresponding amount. The average input, with normal heats and adjusted initial input of 1500 Kw., related to the total duration of the heat, is about 1150 to 1200 Kw., corresponding to a utilization factor of the peak output of about 0.75 to 0.80. Accordingly, the furnace input should be raised to about 2000 Kw. by giving the plant the necessary dimensions. Such a plant must be equipped with a generator set which comprises a generator of approxi-

TABLE I

OPERATING CHARACTERISTICS OF 6-TON HIGH-FREQUENCY FURNACE
FROM DEC. 25, 1937, TO JAN. 5, 1938

Heat No.	Type of Steel, Per Cent C.	Weight of Charge, Lb.	Melting Time Hr./Min.	Charging Time, Hr./Min.	Power to Melt Down, kw.-hr.	Power to Finish, kw.-hr.	Total Power, kw.-hr.	Total Power Per 2000 lb., kw.-hr.
34653	1.03	11,000	8/30	..	4100	500	4600	835
34654	0.50	11,000	3/50	35	3400	400	3800	690
34655	1.00	11,000	3/50	25	3400	400	3800	690
34656	0.70	12,100	3/45	40	3000	500	3500	585
34657	1.00	11,000	4/0	45	3300	400	3700	675
34658	0.70	12,100	3/10	40	3300	100	3400	565
34659	0.70	12,100	4/45	40	3600	400	4000	665
34660	0.40	11,300	3/40	35	3400	300	3700	655
34661	0.50	11,000	3/50	30	3000	400	3400	620
34662	0.70	11,440	3/35	45	3100	400	3500	620
34663	0.80	12,100	3/30	10	2600	900	3500	580
34664	0.50	11,000	3/25	35	3400	500	3900	710
34665	0.30	11,440	3/55	35	3200	500	3700	645
34666	0.70	12,450	4/10	30	3200	500	3700	590
34667	0.10	11,440	4/0	60	3500	400	3900	680
34668	0.50	11,440	3/10	60	3100	400	3500	615
34669	0.60	12,860	3/25	45	3800	200	4000	625
34670	0.30	11,000	4/05	40	3500	300	3800	625
34671	0.70	12,960	3/45	40	3000	500	3500	535
34672	0.30	12,100	3/45	45	3400	600	4000	665
34673	0.70	13,200	3/40	45	3500	500	4000	605
34674	1.00	12,200	3/40	40	3100	500	3600	590
34675	0.50	12,200	3/20	40	3400	400	3800	625
34676	1.00	12,370	3/20	30	3300	300	3600	580
34677	0.50	12,320	3/10	40	3200	400	3600	580
34678	0.70	13,150	4/05	10	3600	200	3800	575
34679	1.00	12,540	3/20	35	3600	400	4000	635
34680	0.30	12,540	3/55	35	3600	500	4100	655
34681	0.09	12,540	3/55	45	3700	200	3900	620
34682	0.30	12,540	3/35	30	3300	500	3800	610
34683	1.02	12,540	4/20	1/05	3700	300	4000	635
34684	0.80	13,850	3/40	15	3500	200	3700	540
34685	0.30	12,615	3/40	55	3400	400	3800	605
34686	0.37	12,540	3/40	50	3500	400	3900	625
34687	1.10	12,505	3/20	50	3100	600	3700	595
34688	1.10	12,100	3/15	35	3300	300	3600	595
34689	0.80	14,100	3/20	20	3700	400	4100	580
34690	0.37	12,430	3/15	50	3400	300	3700	600
34691	0.70	14,000	3/10	45	3200	400	3600	515
34692	1.00	12,920	3/30	40	3300	400	3700	575
34693	4.30	12,810	3/15	30	3700	....	....	575
34694	1.00	12,700	3/25	1/15	3500	400	3900	615
34695	1.00	12,540	3/10	40	3300	300	3600	575
34696	1.00	12,540	3/25	45	3400	300	3700	590
34697	0.50	12,760	3/40	35	3400	500	3900	610
34698	0.52	12,740	3/0	50	3100	400	3500	555
34699	0.50	12,760	3/30	35	3400	500	3900	615
34700	0.50	12,870	3/10	40	3500	400	3900	610
AVERAGE		12,370	3/36 hr.	..	....	...	....	610

TABLE II

OPERATING CHARACTERISTICS FOR 8-TON HIGH-FREQUENCY FURNACE
FROM NOV. 24 TO DEC. 4, 1937

Heat No.	Type of Steel, Per Cent C.	Weight of Charge, Lb.	Total Melting Time, Hr./Min.	Charging Time, Hr./Min.	Total Power kw-hr.	Total Power Per 2000 lbs., kw-hr.
34487	3.50	15,400	12/55	...	6200	805
3488	1.00	14,370	5/15	40	5000	695
3489	1.00	14,400	4/50	50	4900	680
3490	1.00	14,300	4/40	45	4700	655
3491	0.75	15,400	4/40	1	4400	575
3492	0.50	15,400	5/50	1/50	5100	675
3493	1.00	15,400	4/50	55	5100	665
3494	0.50	15,180	4/15	1.05	4800	630
3495	0.10	15,400	5/40	1	5100	675
3496	0.75	16,060	5/50	55	4900	615
3497	1.00	15,400	4/55	1/15	5200	675
34503	1.00	15,400	5/45	40	5200	675
34504	0.70	15,730	4/05	25	4400	560
34505	0.75	16,060	4/30	45	4400	550
34506	0.46	16,600	5/40	40	5200	630
34507	1.00	15,840	5/40	40	5300	670
34508	1.00	15,840	5/30	55	4500	570
34509	0.50	15,840	4/45	50	5200	660
34510	0.50	15,400	4/40	40	5100	655
34511	1.00	15,840	5/0	55	5300	670
34512	1.00	15,840	4/15	40	5500	630
34513	1.00	15,840	5/15	40	4900	620

TABLE II—Continued

Heat No.	Type of Steel, Per Cent C.	Weight of Charge, Lb.	Total Melting Time, Hr./Min.	Charging Time, Hr./Min.	Total Power kw-hr.	Total Power Per 2000 lbs., kw-hr.
34514	0.50	16,700	4/50	30	4700	565
34515	1.00	15,840	4/30	55	4900	620
34516	0.50	16,500	4/05	40	4300	525
34517	0.50	15,400	3/55	25	3200	418
34518	1.00	15,840	4/40	55	5000	630
34519	0.50	15,620	4/05	40	4900	630
34520	1.00	15,840	4/30	55	4800	610
34521	0.75	16,700	4/25	50	4600	550
34522	0.50	16,280	3/55	1/25	5000	615
34523	0.50	15,620	3/45	50	4700	605
34524	1.00	15,840	5/05	50	5100	645
34525	3.00	15,620	4/45	35	4800	615
34526	0.50	16,060	4/30	50	5200	645
34530	0.50	16,280	3/55	50	5100	630
34531	0.50	15,840	4/15	1	5000	635
34532	0.50	15,620	4/15	50	5000	640
34533	0.50	15,840	4/0	1/15	4700	590
34535	1.00	15,890	4/30	40	5100	640
34536	1.00	15,820	4/10	50	4800	610
34537	0.50	16,080	4/20	50	4800	595
34538	...	17,600	4/30	45	4700	535
34539	0.50	16,280	3/40	45	4600	565
34540	1.00	15,840	3/50	45	4700	590
34541	0.40	15,690	4/20	1/10	5000	635
34542	1.00	15,840	4/25	45	5100	645
34543	0.40	15,380	4/35	55	5200	680
34544	1.00	17,690	5/05	40	5800	655
34545	1.00	16,060	4/30	30	5100	630
34546	0.50	15,840	4/30	1/20	5100	640
AVERAGE		15,860	4/37			679

TABLE III

OPERATING CHARACTERISTICS FOR 6 AND 8-TON HIGH FREQUENCY FURNACES

Heat No.	Weight of Charge, lb.	Type of Steel	Total Power Consumed, kw-hr.	Power Per 2000 lb., kw-hr.	Time, Hr./Min.	Generator, kw.	Generator, Volts
			8-TON FURNACE				
34215	16,500	0.93 C.	5300	645	5/00	1500	3000
					5/30	1100	3000
					6/10	500	2000*
					6/40	1400	3000
					8/55	800	2500
					9/50	TAPPED	
TIME OF MELT DOWN:						3 Hr. 55 Min.	
TIME, START OF MELT TO TAP:						4 Hr. 50 Min.	
34216	16,500	0.93 C.	5000	605	10/40	1500	3000
					11/00	1300	3000
					11/30	800	2500*
					12/00	1300	3000
					2/10	800	2500
					3/5	TAPPED	
TIME OF MELT DOWN:						3 Hr. 40 Min.	
TIME, START OF MELT TO TAP:						4 Hr. 25 Min.	
			6 TON FURNACE				
34275**	11,000	1.20 C.	3200	580	5/20	800	2300*
					5/25	1100	3000
					6/10	1300	3000
					7/05	600	2000
					9/05	TAPPED	
TIME OF MELT DOWN:						2 Hr. 55 Min.	
TIME, START OF MELT TO TAP:						3 Hr. 45 Min.	
			Stainless				
34248	9850	0.10 C.	3500	710	4/00	1500	3000
					4/20	1000	3000
					5/00	800	2800*
					5/20	1000	3000
					7/10	800	2500
					8/10	TAPPED	
TIME OF MELT DOWN:						3 Hr. 10 Min.	
TIME START OF MELT TO TAP:						4 Hr. 10 Min.	
			Stainless				
34253	9900	0.09 C.	3200	645	4/45	1500	3000
					5/05	1000	3000
					5/30	800	2800*
					6/00	1000	3000
					8/05	800	2500
					8/20	300	1800
					8/55	TAPPED	
TIME OF MELT DOWN:						3 Hr. 50 Min.	
TIME, START OF MELT TO TAP:						4 Hr. 10 Min.	

* Input capacity has not been fully utilized. ** After patching, furnace was heated carefully.

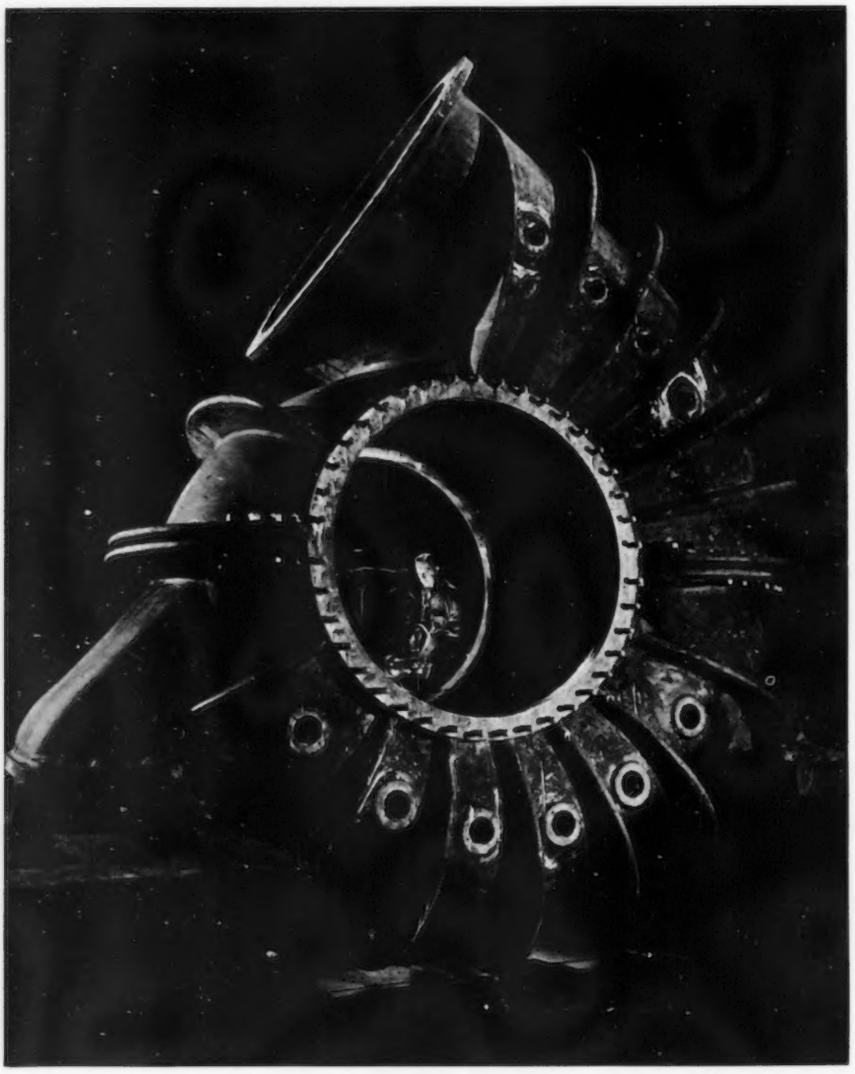
mately 2000 Kw. and a motor of 2300 Kw. Considering the present status of high frequency electrical engineering, their construction will not encounter any difficulties. It will then be possible to shorten to duration of a heat from 4½ hr. to about 3 hr. and to increase the number of heats in 24 hr. from 4 or 5 to 6 or 7. The furnace throughout may then be brought from 35 to 40 tons to about 50 to 55 tons in each 24 hr.

A further improvement of the utilization factor of the high frequency apparatus is possible by parallel operation of two or more high frequency furnaces in that the input of the respective units is adjusted so that the total of the power input constitutes the maximum possible with the connecting line, i. e. about 90 to 95 per cent. Such plants have been in operation for two years, in Germany, at the Dörrenberg steel works in Ründeroth, and thus tested under conditions of practice. In the case just mentioned, two 1320 lb. furnaces are operated in parallel manner with a 250 Kw. generator. Some time ago, a large new plant at the Hochfrequenz-Tiegelstahl G. m. b. H. in Bochum was put in operation which consists of two 4-ton and two 2-ton furnaces operating in a parallel manner and by being fed by a 1600 Kw. generator. By a further development of proved construction principles, by correct operating procedure and parallel arrangement, the path has been laid which will be the generally accepted one to lead to further improvement of the utilization factor and economy in general.

It was the intention of the author to submit to the American public some typical cases from European, chiefly Italian operating practice, and give an outline of the possibilities of future development. In view of the present stage of development of high-frequency electrical engineering, it is to be assumed that the creation of 10 to 15 ton high frequency furnaces will be possible in the near future.

Acknowledgment

In conclusion, the author wishes to express his indebtedness to Dr. Coli of the Cogne works for his kindness in supplying some operating data. The author is also indebted to Prof. Silvestri, president of Cogne Steel Works, Aosta, Italy, who has been responsible for the erection of the new and large high-frequency furnace plants at the works at Aosta, for permitting him to submit to the American public the foregoing article containing some new data.



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HUGE cast iron centrifugal pump casing weighing 45,000 lb.—belonging to one of four 72-in. double-suction sewage pumps now under construction in the shops of Allis-Chalmers Mfg. Co. for the Sanitary District of Chicago. Each complete motor driven pumping unit will weigh 135,000 lb. and will be capable of pumping 375 cu. ft. per sec. of raw sewage and storm drainage at a speed of 138.4 r.p.m. against a head of 19½ feet.

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UTILIZING WASTE PICKLING ACID

DISPOSING of waste pickling acid from steel mills has been the object of much scientific and practical research for many years. A patent on a treatment process was taken out in 1880 and from that time until about 1920 there were numerous ideas patented, most of these methods producing ferrous sulphate, or what is commonly known as copperas.

While very few patents have been taken out in the last 15 years, one improvement was made, to provide that a very minimum of ferrous sulphate be crystallized out and a certain amount always kept re-circulating through the pickle tanks.

Not many years ago there was a sizeable market for copperas in the water treatment processes then in vogue, and the evaporation plants were able to sell tonnages of the product at a fair profit or at least at a cost price. The production costs in these plants ranged from about $5 to $8 per ton. Unfortunately for these plants, however, the past decade has witnessed copperas in the filtration plants being supplanted by alum and various other chemicals.

It is possible to produce sulphuric acid from ferrous sulphate, but there are objections to this possible solution of the waste acid problem, the most serious being that acid so produced would cost more than that made from sulphur.

Of considerable promise is a new process which appears to furnish an answer to this perplexing problem. Covered by patents controlled by the Allied Development Corp., Cleveland, the waste pickle liquor is converted into a building material with insulating properties. The material thus made, which has been given the name "Ferron," is largely a co-precipitated iron hydroxide and calcium sulphate.

Sharon Steel Corp. is at present constructing such a disposal plant at Sharon, Pa., and is the first steel company to tackle the problem of waste acid disposal in this manner.

In this process, the spent liquor is collected in storage tanks. It is then transported through a pipe to precipitating tanks, where the batches of free sulphuric acid and iron salts remain for about one hour and are neutralized with either lime, or other alkaline calcium salts, and then precipitated. The operating temperature is closely held in the neighborhood of 150 deg., the tanks being heated with steam.

The precipitate is then sent through pipes to filter presses. Clear, unpolluted water is discharged into streams or sewers or re-used by the mill, and the matter remaining is Ferron in its plastic form. This Ferron is then run through a plug mill and de-aired. Taken from the plug mill in cake form, the material is then sent to an oven for drying. It is obvious that the entire process is relatively simple and inexpensive.

In the plastic state, Ferron can be molded into any desired shape which later sets into a hard, rigid mass through the combined process of drying and oxidation. The product is a homogeneous, solid appearing material, tan in color. It has advantages over wood, plaster and brick, being fireproof, termite proof, non-warpable, able to stand high temperatures without losing its strength. It is lighter than brick and can be sawed and machined.

While the product is porous, in applications where absorption is un-

(CONCLUDED ON PAGE 81)

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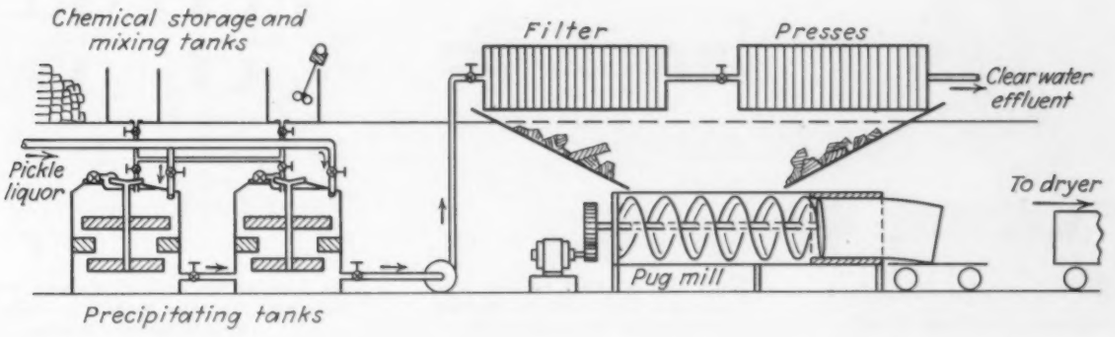
ONE steel company is now building a plant to handle waste pickle liquor in this new manner. Pickle liquor is mixed with other chemicals, the solids resulting being pressed into a building material, the only waste being a clear, comparatively pure water which may be re-used by the mill.



Holding and Supporting Assemblies

By H. M. WEBBER

Industrial Department, General Electric Co., Schenectady, N. Y.

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A COMMON method of holding parts in their indexed positions is by pinning as shown in Figs. 29 and 30. Here tapered pins are driven through small levers pressed on a shaft in order to prevent movement in handling or during brazing. This scheme though subject to the objections outlined for pinning hubs to levers, is commonly employed for indexing certain sub-assemblies to be furnace-brazed for cash registers and business machines.

Wedging Parts Together

Wedges are frequently used to lock members into assemblies. Fig. 31 shows two methods of wedging tungsten-carbide-alloy bits into slots of milling cutters preparatory to furnace brazing. *A* shows use of tapered pins for this purpose, while *B* shows mica or porcelain wedges pressed into the slots. In addition to assuring intimate contact between the surfaces desired to be bonded, these methods have another virtue in that they prevent the carbide bits from becoming brazed to the opposite walls of the slots. Otherwise, upon cooling and contraction of the rim, the carbide would be put in tension and some of the bits might become cracked. With the arrangement shown only one face of the bit is furnace brazed, and no tension develops in the bond while cooling. Because of the intimate contact, strong bonds are produced which result in firm anchoring of the bits into the cutters.

Holding Parts Together With Screws

One manufacturer finds furnace-brazing helpful in making replacement punch holders, in the large sizes, for die sets for punch presses. The one in Fig. 32 is typical of those being furnace brazed. A feature of the construction is that the shank, which is simply cut with ends square from standard bar stock, is drilled and screwed to the holder which is cut from steel plate. The manner in which the assembly is put together is shown in the sketch.

The punch holders which are now electric-furnace-brazed, were formerly made of steel castings. It was necessary to set a casting up in a lathe, face off the holder, and turn down the shank. The castings frequently had blow holes in them which reduced their strength and sometimes caused failures in critical sections. Such breakage of the punch holders often caused serious damage to expensive dies or injured the operators. However, of the hundreds of copper-brazed punch holders which have been made it is reported that not one has ever failed from breakage in the copper-brazed joint. This is a result of the great strength of the bond and the homogeneous structure of the steel. In addition, the cost of the furnace-brazed assemblies is less than half that of the finished steel castings.

Winding Fins on Tubes

A desirable way to improve the heat transfer of tubing is to wind an edgewise fin on the tube and furnace-braze it in position, as shown in Fig. 33. The copper wire can either be applied at the same time the fin is wound, or afterward. When the fins are fairly close together, it is generally not necessary to take precautions to keep the wire adjacent to the fin. The wire must be tied at the ends in order to keep it from unwinding in the furnace.

A useful application of this principle is found in the manufacture of

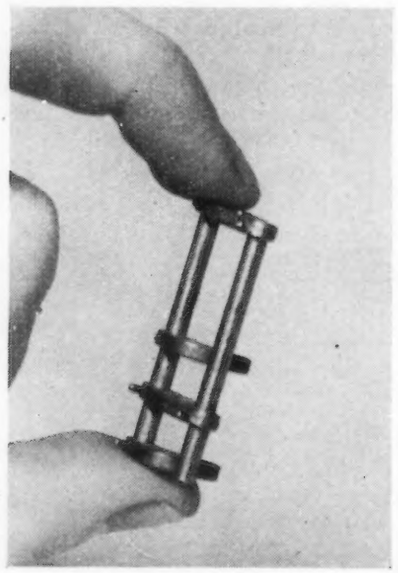

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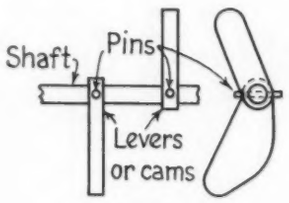
FIG. 29—This cash register sub-assembly illustrates how pinning is used to lock the parts together.



ABOVE

FIG. 30—Pinning of levers or cams to hold their index while being furnace brazed is common practice.

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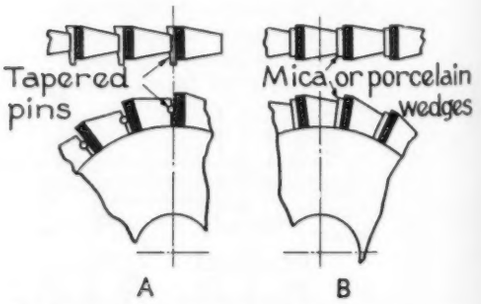


FIG. 31—Two methods of wedging tungsten-carbide bits into slots of milling cutters preparatory to furnace brazing.

in Electric-Furnace Brazing—2

finned Calrod heating elements as shown in the lower view of Fig. 33, and also in Fig. 34. The copper-brazed joint gives a permanency of thermal conductivity between sheath and fin which is unapproached by any other construction.

Overlapping the Members

There are several methods of overlapping members of an assembly which prove quite effective for use in the furnace-brazing process. Fig. 35 shows a few of these methods.

At *A* is shown the edge of a refrigerator evaporator formed of steel, then copper brazed, then porcelain enameled. To get the best bond where the corrugated outer plate touches the smooth inner plate, the assembly is best brazed with the corrugations horizontal so that the copper can puddle down into the joints. Putting copper clips over the upper edge as indicated is an ingenious way of supplying brazing metal to a joint which is rather inaccessible. The clips need be put on only at intervals along the edge since the copper will melt and creep up into the joints and will be drawn along the joints by capillary attraction.

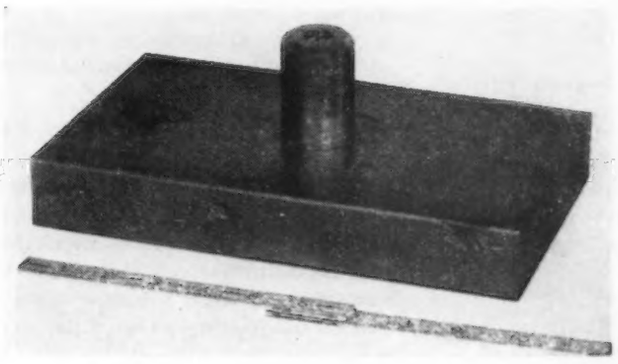
METHODS commonly employed for holding assemblies together for furnace brazing are further described in this article, continued from THE IRON AGE of Sept. 15, page 30. Auxiliary fixtures, both for maintaining proper relationship of the components of an assembly to be brazed and for supporting the assemblies on trays or conveyors, also are discussed.

o o o

At *B* is shown a similar method of overlapping, sometimes used on hollow containers. If a copper wire cannot be held in place, it may be necessary to resort to putting the copper inside the joint, or to apply copper-powder paste along the outside of the seam as indicated.

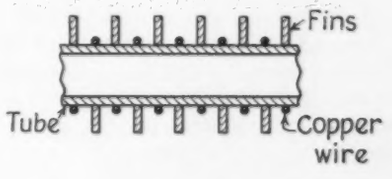
C is a cross section of Bundyweld, copper-brazed, double-walled steel tubing, which is made by laterally rolling copper-plated steel strip into the form shown. This tubing is widely used for automobile gas lines, oil lines, hydraulic brake lines, and gage lines, and is used also in refrigerating machines. It has proved very successful due to its great strength, high resistance to vibration, and low cost. It is ductile and can easily be formed. The ends can be expanded to hold fittings. Although the copper plating on the strip is only about 0.00015 in. thick, the walls are solidly welded together, and the tubing has a uniform copper coloring on the inside and outside after brazing.

A type of overlapping joint to avoid in electric-furnace brazing is that shown in Fig. 36, particularly with long straight seams. It is almost impossible to retain contact of the



BELOW

FIG. 33—Winding fins on tubes and furnace brazing them gives good heat transfer. G-E finned Calrod heating units are made this way.



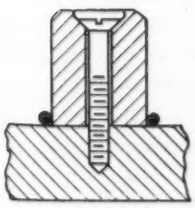


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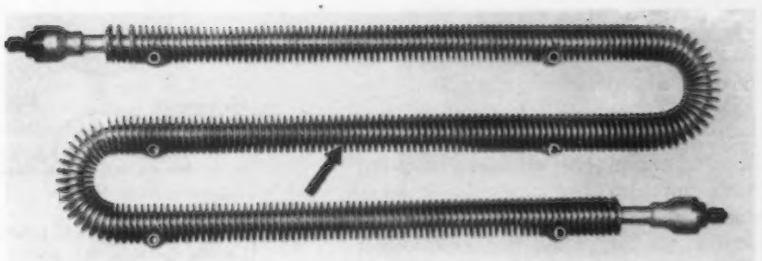
FIG. 32—Screws are commonly employed for holding parts together for brazing. The assembly shown is a punch holder.



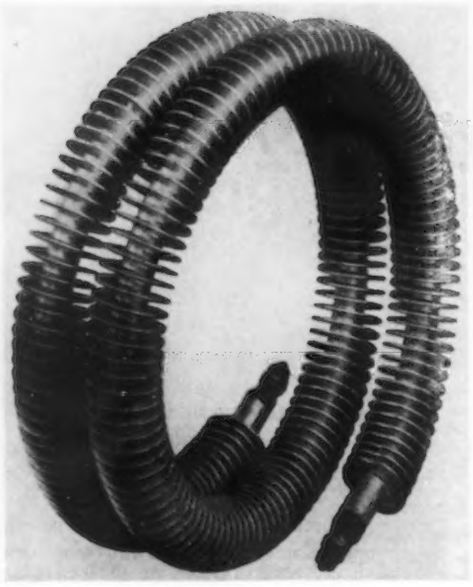


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FIG. 34—Copper-brazed finned Calrod units are used in this form for forced-convection air heating.

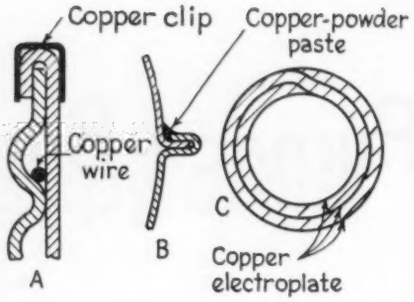

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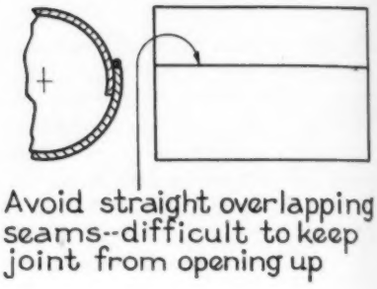
FIG. 35—Types of overlapping joints suitable for use in electric-furnace brazing. The section at C shows the Bundyweld copper-brazed steel tubing.

BELOW

FIG. 36—Overlapping joints of type difficult to make tight and keep tight in furnace brazing.



surfaces within such joints, because of warpage when the assemblies strike the heat, particularly if the diameter is relatively great, say 2 in. or more. The result is opened-up or bulged joints which will leak.

Interlocked Joints

Interlocked joints such as shown in Fig. 37 are frequently used in forming assemblies for electric-furnace brazing. At *A* is shown a cross section of steel tubing with the edges rolled and interlocked to prevent opening up while passing through the furnace. Brazing-metal can be supplied by using either a very thin copper plating or by threading a wire through the tubes and having the joint at the bottom. It is interesting to observe that if sufficient time is allowed, the copper will creep up the inner sides of the tube from the bottom and braze the joint even if the seam is at the top.

B shows an interlocked joint sometimes used in making tubing, or hollow containers. It has the advantage of giving a secure locking effect with very little possibility of opening up in the heat.

Auxiliary Fixtures

All of the foregoing methods of holding assemblies together are commonly used for electric-furnace brazing, the choice of any method depending upon the characteristics of each individual product. But in some cases, it is found impracticable to use any of the suggested methods, and it is then necessary to resort to auxiliary fixtures to properly locate the members with respect to one another while being furnace brazed. These fixtures sometimes take the form of graphite blocks, cast heat-resisting-alloy supports, or clamps. Even tying the assemblies together with heat-resisting alloy wire is resorted to.

Auxiliary fixtures have several disadvantages. In the first place, they present additional mass which must be heated up, they slow down production of the furnace because of the extra mass to be heated, they are subject to warpage which might make them unusable, and they present an extra item of maintenance expense. However, two examples where auxiliary fixtures have been used to advantage are as follows:

Graphite Blocks.—Tungsten contacts for automobile-ignition systems are supported in graphite blocks as shown in Fig. 38 and 39, while being copper brazed in electric furnaces. The purpose of the blocks is to center the tungsten disks on the heads of the steel shanks, there being copper shims between the disks and shanks to supply the brazing metal. A slight clearance must be left around the head of the shank so that the shank can settle down as the copper melts. It is interesting to observe that the manufacture of tungsten contacts was the first commercial application of electric-furnace brazing to large-scale production, and that the method of brazing the contacts in graphite or heat-resisting alloy blocks as shown is essentially the same now as it was in 1912.

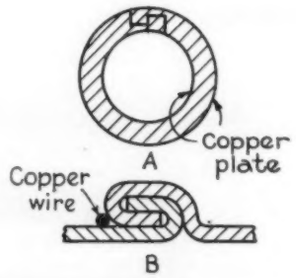
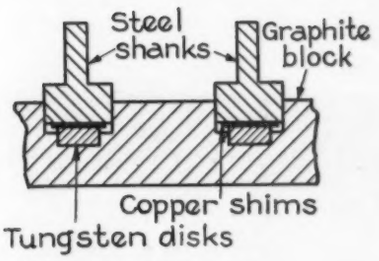


FIG. 37—Types of interlocked joints suitable for use in electric-furnace brazing.

Graphite slabs are sometimes employed as trays or bottom supports for assemblies because of their ability to remain flat and straight, thus giving an even bearing surface which results in minimum distortion of assemblies which are otherwise subject to distortion.

In supporting steel parts on graphite some diffusion of carbon into the steel is to be expected. In fact, the time in the heat is critical in some cases, because the diffusion is so rapid that high concentrations of carbon can be built up and cause sufficient depression of the melting point of the steel as to result in melting of the surfaces of the steel members contacting the graphite. This carburizing action generally can be prevented by covering the upper surface of the graphite with a thin sheet of asbestos paper.

Graphite blocks or slabs can be obtained from such vendors as the National Carbon Co., Inc., Cleveland. The vendor named makes a grade "AGR" graphite which has been used successfully for this application.



FIGS. 38 and 39—Graphite blocks are sometimes used for supporting assemblies. Tungsten contacts for automobile ignition coils are furnace-brazed by holding the tungsten disks and steel shanks in place in recesses of graphite slabs.

It is available from a list of standard sizes or in special sizes.

Clamps. — Fig. 40 shows a method of holding the members of a tungsten-carbide-alloy knife while being electric-furnace brazed. Clamps made of heat-resisting alloy bolts and bar-stock are improvised to lock the carbide bits to the steel shanks, there being several of these clamps used in the length of a knife. Brazing metal in the form of copper strip can be placed near the joint as shown, or copper paste can be used. A mica or asbestos insert is sometimes employed to keep the carbide bit from becoming brazed to the cross bar. The mica insert may not be needed between the steel shank and cross bar on some jobs, such as at the right in Fig. 40, because the distance from the brazed joint to the bar is sufficiently great so that the copper will not creep that far in the allotted brazing time.

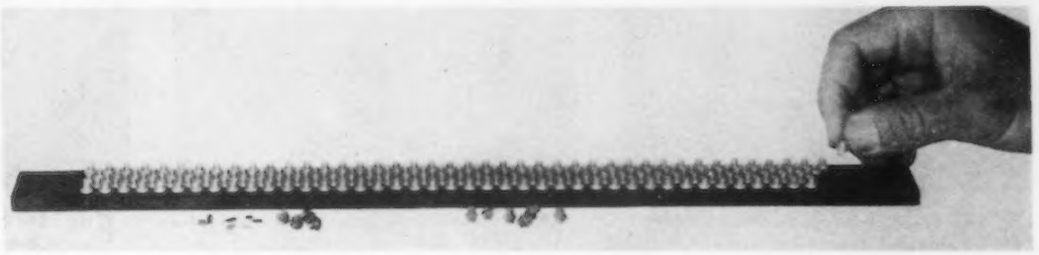
It should also be kept in mind that the clamps expand as they heat up, and they may not always hold assemblies together tightly at copper-brazing temperatures even though they are drawn tight when cold. Free-fitting threads should be used to assist in taking the nuts off after going through the furnace. Otherwise, the nuts might stick and require scrapping of the bolts.

Supporting Fixtures Sometimes Used

In addition to using auxiliary fixtures for maintaining proper relationship of the members of assemblies to be brazed, auxiliary fixtures are also sometimes used to support the assemblies on trays or conveyors, simply for the purpose of (1) keeping the assemblies in the best position for proper flow of brazing metal, (2) keeping the assemblies from tipping or rolling off the conveyor, or (3) keeping them from touching and becoming brazed to one another.

Three typical examples of such auxiliary fixtures are illustrated in Figs. 41, 42 and 43. Fig. 41 shows how a cylindrical support is made of heat-resisting alloy strip which is tack welded at the seam. The support shown holds a refrigerator float in place on the belt so that it will not roll.

Fig. 42 shows a heat-resisting cast-alloy support which holds two refrigerator muffle-box assemblies in the most desirable position for furnace brazing. When the assemblies are in this position, the brazing metal, in the form of copper-wire rings at the joints, has an opportunity to flow downward into the joints. Fig. 43 shows a supporting fixture made of heat-resisting alloy wire, which holds a refrigerator piston in the upright position so that the flow of copper will be influenced by gravity to the best advantage.



The supports made of strip and wire usually consist of alloys containing 80 per cent nickel, 20 per cent chromium, while the cast support illustrated is made of an alloy containing 35 per cent nickel, 15 per cent chromium, 50 per cent iron. Other alloys also are, of course, commonly used.

Assemblies Placed Directly on Conveyor

When heat-resisting-alloy conveyors or trays are employed, which generally develop a protective film of chromium oxide in use, it is usually satisfactory to rest the assemblies directly upon them because there is very little

AT RIGHT

FIG. 41—Cylindrical sheet alloy supports are used to keep refrigerator floats in position on the mesh-belt conveyor of the furnace.

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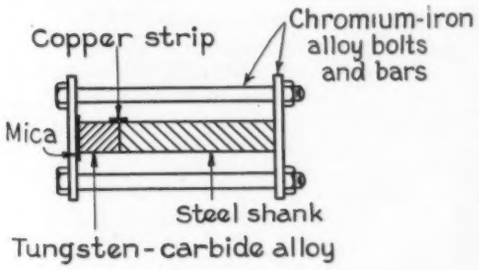

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FIG. 40—Though a last resort, alloy-steel clamps are occasionally employed to hold parts together. The assembly shown is a knife with tungsten-carbide cutting edge.

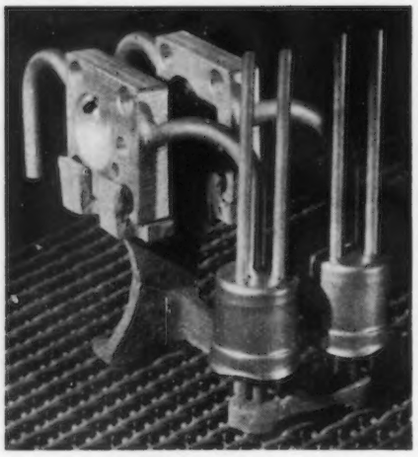

FIG. 42—Cast-alloy fixtures are invaluable for supporting assemblies in upright position to obtain proper flow of copper into the joints.

FIG. 43—Wire fixtures made of heat-resisting alloy are effective for supporting assemblies in upright position to permit brazing metal to flow downward into joints.

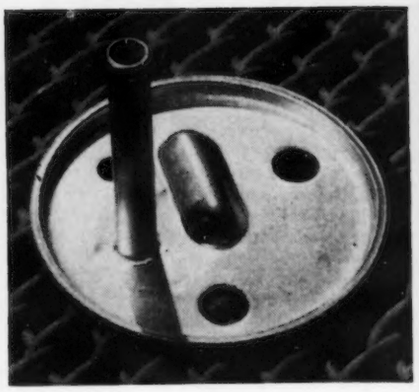

FIG. 44—Assemblies while being furnace brazed can rest directly on the alloy mesh-belt conveyor or charging trays used in the furnace.

chance of the assemblies becoming brazed to these alloy members. When the alloys have been in service a long time, however, some sticking is likely to be noticed. Particular care should be taken to see that fluxes are not allowed to come in contact with the alloy parts because the result will be quick destruction of the alloys due to the continuous removal of the protective oxides which form.

Fig. 44 shows a typical refrigerator sub-assembly resting directly on a belt conveyor. The joint to be brazed is at the very botton, adjacent to the conveyor. The brazing metal comes in actual contact with the conveyor but no bond is made with it, and the assemblies are easily removed from the conveyor at the discharge end of the furnace.

Sometimes trays made of steel are employed, in which case it is desirable to cover them with sheets of thin asbestos paper in order to prevent the assemblies from being brazed to the trays. Some shops carry asbestos paper in several thicknesses because it is handy for use as spacers or shims in setting up objects of irregular shapes. Asbestos paper is obtainable from vendors of heat-insulating materials. Small alundum-compound blocks, obtainable from refractory manufacturers, also are quite handy. Mica is a good material for separating where it is desired to keep members from becoming brazed together.

(TO BE CONTINUED)

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THIS shows the "grand hall" of the Holland-America Line's new ship, Nieuw Amsterdam, which has doors made of Enduro stainless steel, product of Republic Steel Corp. This metal was used in kitchens and elsewhere on the vessel.

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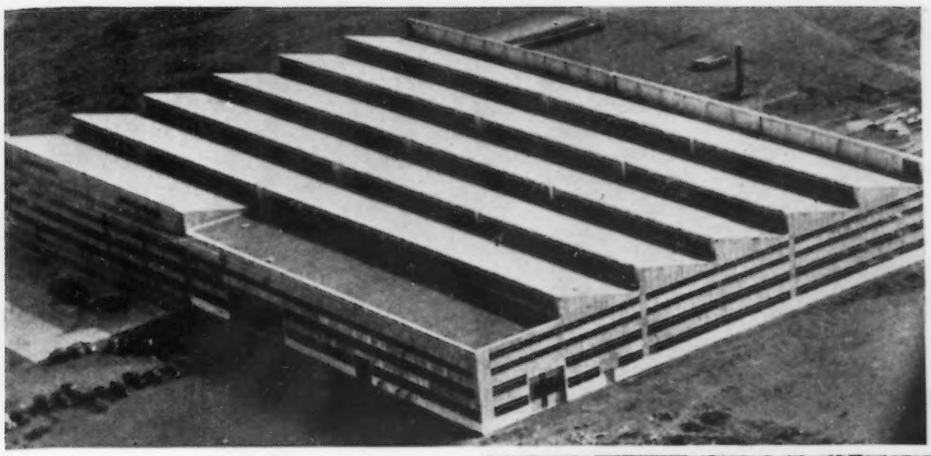
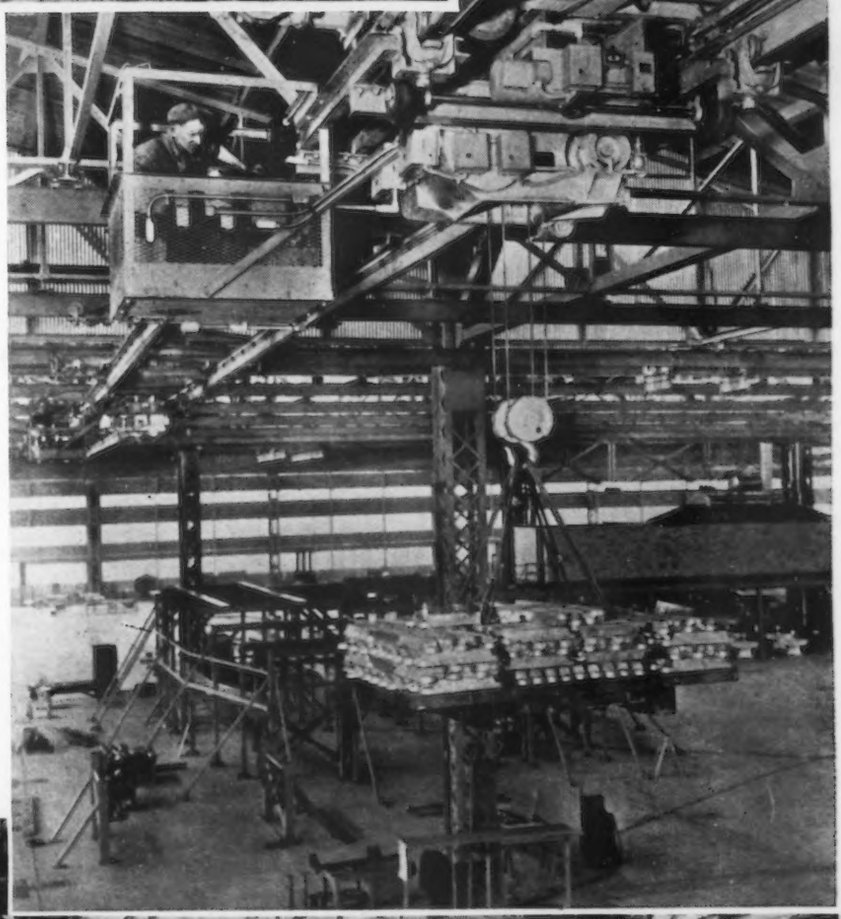
More Space for Clipper Ships and Flying Fortresses





ABOVE

BOEING'S new plant No. 2: In this 300 by 450-ft. modern factory building at Seattle, the new four-engined Boeing Model 307 transports for TWA and Pan American Airways will be assembled. The first unit of the building, a 200 by 300-ft. assembly section, entirely without obstruction, was built less than two years ago by the Austin Co. Recently the same builders have completed two additional 125 by 300-ft. bays, increasing the plant's clear working space to nearly 5,000,000 cu. ft.

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AT RIGHT

A CLOSE-UP view of one of the American Mono Rail Co.'s crane carriers in the Boeing Aircraft Co.'s new plant No. 2 at Seattle, Wash.

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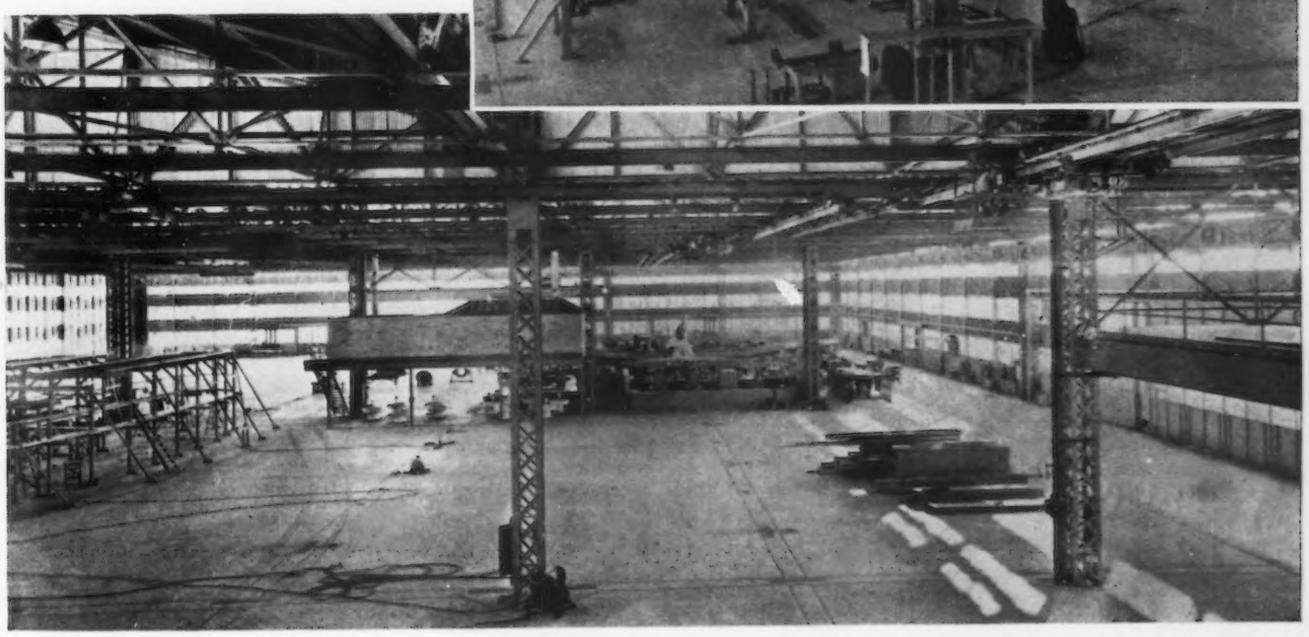
BELOW

INTERIOR of Boeing's latest plant addition. Crane runways, spanning the 300-ft. width of the building, are apparent overhead Crane bridges, staggered along the runways, can be seen at the right.



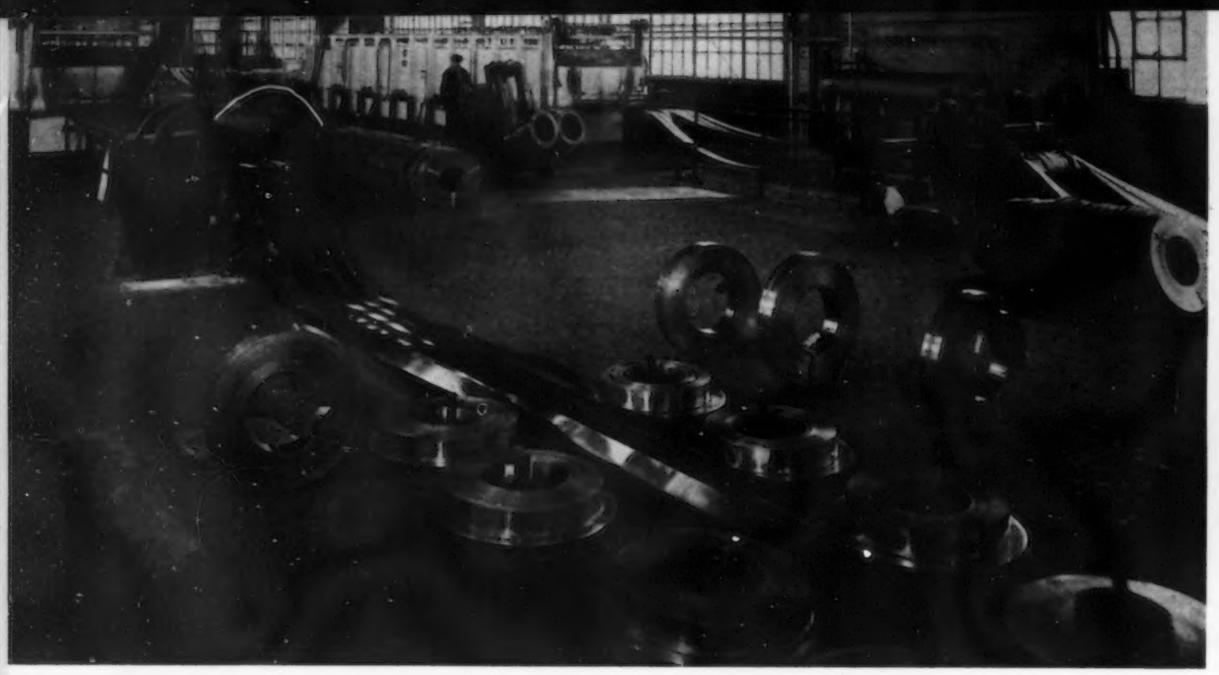


FIG. 1—Heat treating silicon strip at Warren, Ohio, plant by pulling it through roller hearth furnaces, to produce a product that will have required electrical properties and will lie flat when uncoiled.

Coiled Silicon Strip Steel . . .

By BURTON LONGWELL
Republic Steel Corp.

THE recent development of coiled silicon strip steel and its widespread adoption by electrical manufacturers in making laminations for motors, transformers, and other electrical apparatus has been one of the most significant advancements in the perfection of electrical steels.

Every year since it was introduced in 1930, the production of coiled silicon strip has increased over the preceding year, total production in 1937 being almost 15 times greater than it was five years ago.

Possessing all of the properties of corresponding grades of sheets, yet without any of the shortcomings of "coil set," silicon steel in the form of coils results in less scrap, reduces handling costs, and in many instances increases die life. Until the development of coiled silicon strip, laminations used by electrical manufacturers were, of course, punched or sheared from flat steel sheets. Today, coils up to 30 in. wide are being produced, and many are predicting that coils will eventually completely supplant sheets in this field.

Silicon steels used in electrical apparatus contain from 0.2 to 4.0 per cent silicon, depending upon the application, and a minimum amount of carbon and other metalloids. The qualities which determine the success of silicon steel for this purpose are: (1) High permeability, (2) low core loss, (3) freedom from loose scale, (4) close gage and width tolerances, (5) minimum brittleness, (6) good punching properties, and (7) ability to stack flat after punching.

To obtain these qualities, every step in the manufacturing process must of course be subjected to the closest metallurgical control.

Until the development of coiled silicon strip there had been no radical change in the methods of production of electrical silicon steel for some 25 years. Naturally, important improvements in the process were constantly made during that period. The material, say ten years ago, was of far better quality than it was ten years before that. But the basic mill operations for producing it remained the same.

A recent revolutionary development in the steel industry however introduced vital new elements in that picture. New mills which made the rolling of sheets a continuous process and made possible the production of steel in the form of coils of strip, were designed and built for the rolling of carbon steels. Some of the sweeping improvements incorporated in these new continuous mills for the rolling of carbon steels, it seemed obvious, might very well be applied to the manufacture of electrical silicon steels.

At least two important new problems which the manufacturers of carbon steels did not have to face, however, had to be solved by the makers of silicon strip. A new annealing process had to be developed so that the product would stay flat when un-

coiled, and some effective method had to be found of restoring to the steel the desired electrical properties which were destroyed by the cold strip rolling process.

Without a solution to these problems, coiled silicon strip would have no commercial value. Neither "coil set" nor "cross curvature" could be tolerated. Not only would mechanical difficulties be encountered in the punching of strip containing "coil set," but (and this is a prime objection) the resulting laminations, not being flat, would not stack properly.

Ordinarily, silicon sheets are annealed by the conventional box annealing process. A pile of 15 to 20 tons of sheets are placed in a large sealed container and subjected to a relatively high temperature for a period of from 25 to 96 hr. But such an annealing practice would not be satisfactory in the case of coiled strip because if the steel was heated and then allowed to cool in coil form it would have pronounced "coil set."

The second problem was also a very serious one. Silicon steel is generally used in thicknesses of from 0.025 in. (24 U. S. Standard gage) to 0.014 in. (29 gage). This is considerably lighter than the thicknesses that can be rolled directly on a continuous hot strip mill. In the cold working of the steel which is therefore made necessary in order to get it down to the desired finish gage, however, the highly strained steel loses its electrical properties.

A very satisfactory solution to both of these problems was found in the development of an entirely new technique for the heat treatment of silicon strip. This new technique consists of pulling the ribbons of strip at an exact, predetermined speed and temperature through atmosphere-controlled roller hearth furnaces. The strip is temporarily welded together to make the process a continuous one. The steel is coiled some distance from the discharge end of the furnace after it has had a chance to cool to room temperature, resulting in a product that will lie flat when uncoiled at the user's punch press.

In addition to removing "coil set" this type of furnace gives an exceptionally uniform anneal and very satisfactorily removes the destructive effects on the electrical properties caused by the cold reduction process. Further, mechanical control of furnace operations is very accurate so that the heat treatment is imparted uniformly to every square inch of strip.

An incidental, yet very important feature of this new annealing technique is the fact that the type of mill scale or oxide produced on silicon strip is of a different nature from the characteristic of silicon sheets. This is due primarily to the atmosphere control features of the furnace.

Silicon steels used in electrical apparatus require a continuous coating of some form of insulation, such as mill scale, in order to reduce eddy current losses. It is of the utmost importance that the mill scale be tenacious, otherwise it becomes loose and breaks off in fabrication. Loose scale also materially reduces die life.

The oxide on silicon strip made in the new furnaces is not only very tenacious, precluding rupture of the scale while being punched, but it is also extremely light. Thus it offers less abrasion resistance to the punching dies and consequently results in longer die life.

While it is apparent that the many mill operations and processes necessary for the production of coiled silicon strip entail more expense than that incurred in the making of flat silicon sheets, at the same time the increasing demand for this product has reached such a point that it is possible to furnish coiled silicon strip at only a slightly higher price than that charged for silicon sheets of the same gage, width and grade.

The differential in price is generally readily assimilated, moreover, by the realization of at least three important economies: saving in scrap, reduced handling cost and increased die life.

The saving in scrap affected by the use of coiled silicon strip is a very considerable item. Individual flat silicon sheets are seldom more than 124 in. long. Due to limitations in sheet mill practice, exact sheet mill lengths cannot be obtained without the payment of an extra charge. The user therefore has on his hands at the end of each slit sheet, scrap material of either half-punched laminations or unused sheet. Silicon strip, on the other hand, comes in lengths of from 700 to 1700 lineal feet, depending upon the gage ordered. With such long coils, scrap at the end is encountered much less frequently—an obvious saving. The fact that silicon steel is now available in coiled form has also materially increased the use of scrapless dies in punching operations.

The second important economy, that of reduced handling cost is both a labor and a time saving factor. This is especially true in the case of the narrow widths, say 1 in. stock such as used in electric shaver motors, which are extremely difficult to handle. Full weight coils of silicon strip weigh approximately 75 lb. per in. of width, a coil of strip 5 in. wide, for example, weighing 375 lb. This is the standard of weight found most economical and convenient in the majority of shops.

Silicon coils of this weight standard are easily unloaded from trucks or cars when received at the final destination. They are convenient to stock and are readily mounted on reels at the punch press. Since the coils are delivered already slit to the desired width the slitting operation by the user is eliminated. This means the

(CONTINUED ON PAGE 82)

FIG. 2—Testing silicon strip to verify its high permeability, low core loss, and uniform temper.

L. F. COFFIN is president of the Association of Iron and Steel Engineers as well as superintendent of the mechanical department, Bethlehem Steel Co., Sparrows Point, Md.

Technical Papers on Convention of Iron

WITH maintenance replacements and operating costs of greater interest this year than ever before to steel and its allied industries, more than 5000 steel executives and plant operators will gather Sept. 27-30 at Cleveland to hear 20 technical papers on those subjects presented at the Association of Iron and Steel Engineers' convention.

Probably the most comprehensive program yet to be presented has been arranged for technical sessions which will be held in the Cleveland Public Auditorium in conjunction with the Iron and Steel Exposition. In addition to social functions, inspection trips have been arranged to Republic Steel Corp.'s 98-in. hot and cold strip mill, and General Motors Corp.'s Fisher Body plant at Cleveland.

Many of the technical papers will deal with processing and manufacture of wide strip steel, while a feature will be a paper on "Modern Blooming Mill Design," by Lorenz Iversen, president, Mesta Machine Co., Pittsburgh.

Leading steel mill engineering authorities will discuss electrical, mechanical, metallurgical, combustion, lubrication and welding engineering, as applied to the steel industry as a whole.

Seamless Mill Model Ready

More than 100 manufacturers of steel mill equipment will exhibit their latest designs and products in the annual Iron and Steel Exposition. Outstanding will be an animated model of a new seamless tube mill recently designed and built by Aetna-Standard Engineering Co., Youngstown, for Youngstown Sheet & Tube Co., Youngstown. The model mill will actually roll lead pipe from lead billets and is a replica of the first large seamless tube mill to be built in this country in over seven years.

All social events will be held at the Hotel Statler, Cleveland, while technical sessions and exhibitions will be held under one roof at the Cleveland Public Auditorium. Tom M. Girdler, board chairman, Republic Steel Corp., Cleveland, will address the members and guests of the Association of Iron and Steel Engineers at the formal banquet, Sept. 29.

Said L. F. Coffin, superintendent, mechanical department, Bethlehem Steel Co., Sparrows Point, Md., and president of the association:

"As the annual Iron and Steel Exposition opens in Cleveland on Sept. 27 and the Association of Iron and Steel Engineers presents its technical program in connection with this meeting, the importance of these events to the steel industry will be twofold.

Men and Machines

"In the first place the exposition itself will display the latest designs of more than one hundred manufacturers of steel mill equipment, occupying 25,000 sq. ft. of exhibit space. The technical program is probably the best balanced and most authoritative yet presented by the association. Active operating men as well as designers and manufacturers will discuss many of the most up-to-date developments of steel mill engineering. Not only will marvelous technical advances be fully described, but inspection of the Republic strip mills will serve to impress these advances more fully.

"There is another manner in which this exposition and meeting should have its effect on the steel industry, if it is more nearly to accomplish its full purpose. Equipment and mills are only the tools. The men who man and maintain these tools must keep pace with them; must understand and master them, if their full usefulness is to be obtained and if further advances are to be made. As these tools become more refined and complicated, so must the training of men for these jobs become more specialized and more thorough. Operating and service departments alike require new and widely extended training programs if we are to achieve the fullest capacity and quality from each of our new mills.

"If this meeting impresses more clearly on us the far-reaching scope of these technical changes and thereby makes us more conscious of the human problems involved and causes us to modify, improve, and accelerate our methods of training men to maintain and operate these mills, it will have served well indeed.

Inspiration Hoped For

"Managements and their operators and engineers can well afford to participate to a full extent in the activities at Cleveland to the end that a full interchange of thoughts and

Vital Topics Await and Steel Engineers

C. C. WALES, who serves as first vice-president of the Association of Iron and Steel Engineers, is also assistant general manager, Algoma Steel Corp., Sault Ste. Marie, Ont.

ideas, and renewed inspiration may result."

The program of the technical sessions to take place at the Cleveland Auditorium is as follows:

Tuesday, Sept. 27

ELECTRICAL ENGINEERING DIVISION

(9:30 a.m.—Club Room B)

"A Study of the Requirements of 440-Volt, A-C Motor Control for Steel Mills," by Donald C. Nelson, assistant electrical engineer, and J. Russell Powell, general foreman, Jones & Laughlin Steel Corp., Pittsburgh.

"Performance of Slabbing Mill Auxiliary Drives with Ward-Leonard Control," by W. A. Perry, superintendent, electric and power departments, Inland Steel Co., and W. B. Snyder, industrial engineering department, General Electric Co.

METALLURGICAL AND WELDING ENGINEERING DIVISION

(1:30 p.m. — Club Room B)

"Continuous Pickling of Wide Strip Steel with Flash Welding," by L. R. Milburn, engineer, Great Lakes Steel Corp., Ecorse, Mich.

METALLURGICAL ENGINEERING DIVISION

(2:30 p.m. — Club Room B)

"Electrolytic Pickling of Strip Steel," by H. W. Neblett, engineer, Inland Steel Co., East Chicago, Ind.

"Pickling of Strip Steel from the Metallurgical Point of View," by H. P. Munger, metallurgist, Republic Steel Corp., Warren, Ohio.

WELDING ENGINEERING DIVISION

(2:30 p.m. — Club Room A)

"European Welding Practice and American Trends," by C. H. Jennings, research engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh.

"Welding as Used in Industrial Plants," by Dr. Gilbert Doan, Lehigh University, Bethlehem, Pa.

Wednesday, Sept. 28

MECHANICAL ENGINEERING DIVISION

(9:00 a.m. — Club Room B)

"Finishing Equipment for Wide Strip Mills," by John L. Young, manager machinery sales, United Engineering and Foundry Co., Pittsburgh.

"Modern Blooming Mill Design," by Lorenz Iversen, president, Mesta Machine Co., Pittsburgh.

"Brief Review of Developments in Flat Rolling of Steel Products," by Stephen Badlam, Consulting Engineer, Pittsburgh.

(1:00 p.m.)

Inspection Trip: 98" Hot and Cold Strip Mill, Republic Steel Corp., Cleveland.

Thursday, Sept. 29

ELECTRICAL ENGINEERING DIVISION

(9:00 a.m. — Club Room B)

"Acceleration of Tandem Cold Strip Mills," by T. R. Rhea and M. J. Leding, Engineers, General Electric Co.

"Low Voltage Rectifiers for Industrial Requirements," by G. E. Stoltz, manager, metal working section, Westinghouse Electric & Mfg. Co., and J. H. Cox, manager, rectifier engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

COMBUSTION ENGINEERING DIVISION

(9:00 a.m. — Club Room A)

"Standardization of Steel Plant Fuel Accounting and Test Procedure for Fuel Consumption Determination," by H. V. Flagg, combustion engineer, American Rolling Mill Co., Middletown, Ohio.

"Oil Burning and Its Control," by A. J. Fisher, fuel engineer, Bethlehem Steel Co., Sparrows Point, Md.

"Use of Mixed Gases for Steel Mill Operations," by E. T. W. Bailey, combustion engineer, Steel Co. of Canada, Ltd., Hamilton, Ont.

LUBRICATION ENGINEERING DIVISION

(2:00 p.m. — Club Room A)

"Design and Lubrication of Gears and Pinions," by Clark Johnson, manager, gear department, United Engineering & Foundry Co., Pittsburgh.

"American and European Lubrication Practice for Steel Mills," by R. M. Gordon, Gordon Lubricators Division, Blaw-Knox Co., Pittsburgh.

"Lubrication Problems of Modern Continuous Rolling Mills," by L. Ballard, supervising industrial engineer, Tide Water Associated Oil Co., New York.

MECHANICAL ENGINEERING DIVISION

(2:00 p.m. — Club Room B)

"Design and Operation of the Modern Blast Furnace," by J. C. Barrett, Carnegie-Illinois Steel Corp., Youngstown.

"Modern Coke Oven Design and

Practice," by Fred Denig, vice-president, Engineering and Construction Division, Koppers Co., Pittsburgh.

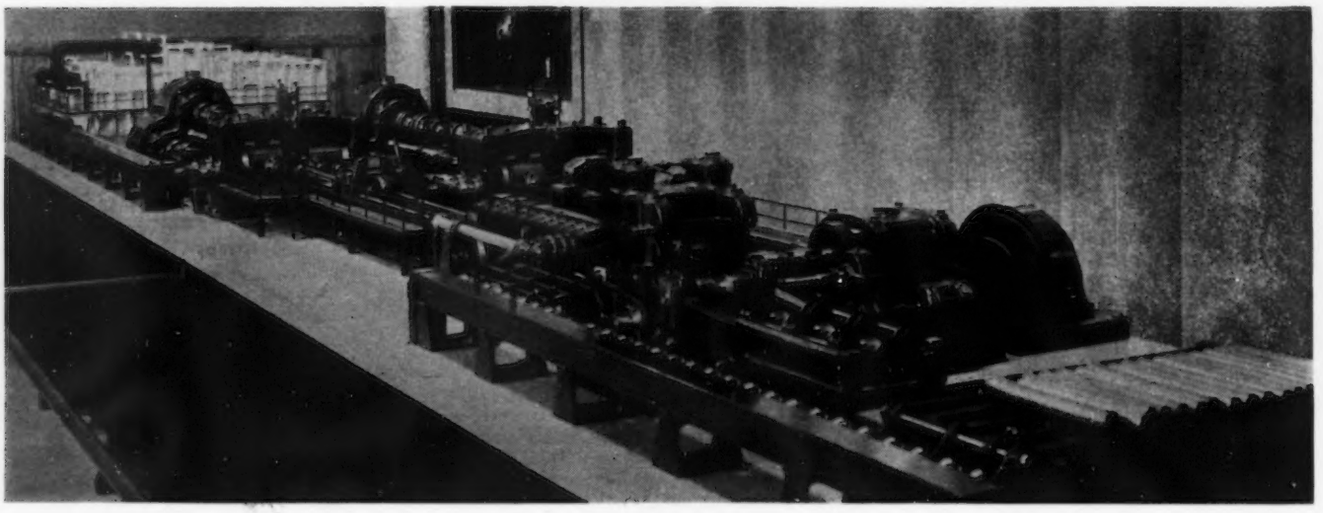
Friday, Sept. 30
(9:00 a.m.)

Inspection Trip: Fisher Body Plant, General Motors Corp., Cleveland.

Following is a list of companies whose exhibits will be on display at the Iron and Steel Exposition, Cleveland Auditorium, on Tuesday, Sept. 27, from 1:30 p. m. to 5:30 p. m. and from 7 p. m. to 10 p. m.; Wednesday, Sept. 28, from 10 a. m. to 10 p. m.; Thursday, Sept. 29, from 10 a. m. to 5:30 p. m.; and Friday, Sept. 30, from 10 a. m. to 4 p. m.:

Exhibitors	Booth Numbers
A	
Alliance Machine Co.	147
Allis-Chalmers Mfg. Co.	140-141-142-143-144-145
Aluminum Co. of America	81-82
American Car & Foundry Co.	11-12
Amsler-Morton Co.	6-7
Askania Regulator Co.	88
Atlas Car & Mfg. Co.	10
Automatic Transportation Co.	64-65-66-67
Aetna-Standard Engineering Co.	Special Exhibit
B	
Baker-Raulang Co.	134-135-136
Bantam Bearings Corp.	108-109
Benjamin Electric Mfg. Co.	102-103
Blaw-Knox Co.	120-121-122
S. F. Bowser & Co.	175-176
Broderick & Bascom Rope Co.	150
Charles Bruning Co.	4-5
Bull Dog Electric Products Co.	118
Bussmann Mfg. Co.	83
C	
Chisholm-Moore Hoist Corp.	173
Clark Controller Co.	18-19-20-21
Cleveland Crane & Engineering Co.	46
Cleveland Worm & Gear Co.	130-131-132
Colt's Patent Firearms Mfg. Co.	47
Columbus-McKinnon Chain Corp.	173
Crocker-Wheeler Electric Mfg. Co.	2-3
Crouse-Hinds Co.	27
Cuno Engineering Corp.	125-126
Cutler-Hammer, Inc.	44-45-60-61
D	
De Laval Separator Co.	129
Delta-Star Electric Co.	59
Joseph Dixon Crucible Co.	110
E	
Edison Storage Battery Division Thomas A. Edison, Inc.	9
Electric Controller & Mfg. Co.	84-85-86-87
Electric Storage Battery Co.	117
Electrical Engineers Equipment Co.	89
Elwell-Parker Electric Co.	148-149
F	
Farrel-Birmingham Co.	127
Farval Corp.	130-131-132
Fulton Foundry & Machine Co.	165
G	
Garlock Packing Co.	14-15
Gatke Corp.	79-80
General Electric Co.	68-69-70-71-72-73-74
Graybar Electric Co.	166
Great Western Fuse Co.	77
H	
Hagan Corp.	99
Heppenstall Co.	23-24
Hodson Corp.	157
Holophane Co.	111
Homestead Valve Mfg. Co.	8
Hyatt Roller Bearing Division General Motors Corp.	30-31
I	
Ideal Commutator Dresser Co.	146
Iron Age	155-156
I-T-E Circuit Breaker Co.	57-58
J	
Jefferson Electric Co.	22
Johns-Manville Corp.	96-97
K	
Kane & Roach, Inc.	119
Keystone Lubricating Co.	1
Koppers Co.	49-50
L	
Le Carbone Co.	17
Lincoln Engineering Co.	174
Link-Belt Co.	75
M	
Martindale Electric Co.	94-95
Mesta Machine Co.	28-29
Metals and Alloys	168-169
Miller Co.	16
Morgan Construction Co.	112-114
Morgan Engineering Co.	92-93
Morganite Brush Co.	43
N	
National Carbon Co.	38-39
National Electric Coil Co.	55-56
O	
Osborn Mfg. Co.	177-178
Otis Elevator Co.	139
P	
Penton Publishing Co.—Steel	163-164
Philadelphia Gear Works	2-3
Philco Radio & Television Corp.	133
Poole Foundry & Machine Co.	42
Post-Glover Electric Co.	25
Pyle-National Co.	115-116
R	
Railway & Industrial Engineering Co.	123-124
Ready Power Co.	137
Reliance Electric & Engineering Co.	51-52-53-54
Rockbestos Products Corp.	48
Russell & Stoll, Inc.	180-181
Joseph T. Ryerson & Son, Inc.	138
S	
Socony-Vacuum Oil Co.	90-91
Steel Publications, Inc.	151
Stewart-Warner Corp., Alemite Division	167
T	
Texas Co.	98
Timken Roller Bearing Co.	106-107
Tool Steel Gear & Pinion Co.	40-41
Trabon Engineering Corp.	78
Trumbull Electric Mfg. Co.	100-101
U	
United American Bosch Co.	76
United Engineering & Foundry Co.	104-105
W	
Wagner Electric Corp.	62-63
Wellman Engineering Co.	158
Westinghouse Electric & Mfg. Co.	32-33-34-35-36-37
Edwin L. Wiegand Co.	26
Y	
Yale & Towne Mfg. Co.	128-128A
Youngstown Sheet & Tube Co.	Special Exhibit

OUTSTANDING among exhibits at the Iron and Steel exposition, to be held at Cleveland in connection with the American Iron & Steel Engineers' convention, is a model seamless tube mill (pictured below) built for Youngstown Sheet & Tube Co. from original drawings by company employees.



The Development of Chrysler's Superfinish—III

By WILLIAM F. SHERMAN
Detroit Editor, The Iron Age

THIS is the last of a series of articles on "The Conception, Development, Equipment and Measuring Methods for an Entirely New Surface Finishing Method — SUPERFINISH." It deals with the design of machinery used to Superfinish some automobile parts in Chrysler Corp. plants and discusses the advantages of Superfinish from the manufacturer's viewpoint and the benefits to the consumer through product improvement.

IN the second part of this series on Superfinishing, it was pointed out that the fundamental technique has been applied to the final finishing of a wide variety of automotive parts. The diversity in size and shape of these parts has necessarily called for Superfinishing machines differing radically in appearance, machine elements and control, since the relationship between reciprocation and rotations of part and stones also varies widely according to the material being worked. Like most equipment furnished the automotive industry, the Superfinishers built by the Foster Machine Co. are necessarily special-purpose in character. One such machine, for finishing the heads of valve tappets, was illustrated in Fig. 16 at the end of Part II. The brake drum machine, Fig. 17, and its counterpart, the brake shoe Superfinisher, Fig. 18, both illustrated in this article, are additional good examples of the design of modern special-purpose machines of this new type.

The drums, which are centrifugally cast iron in steel rims welded to stamped flange plates, come to the Superfinisher after the turning operation. They are placed in the single-spindle machine in a jig mounted above a pneumatic cylinder which raises the drum up to the tool where it is held in position by a hooked clamp which locks auomatically.

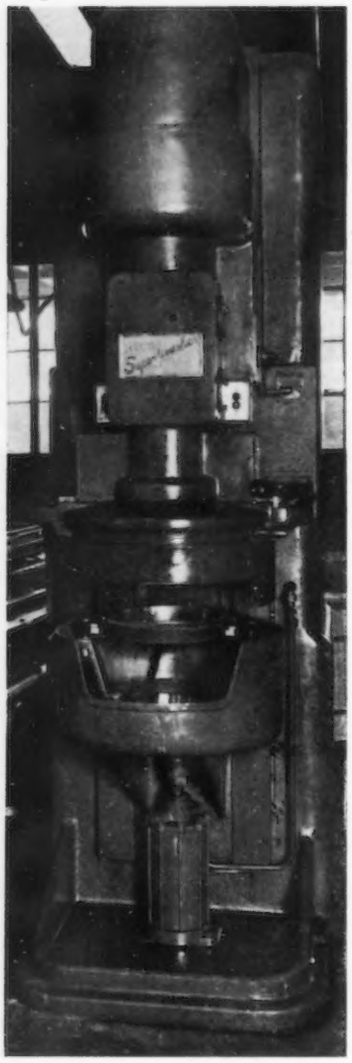
The roughing stones act against the brake surface alone for the first few seconds of the cycle, then both roughing and finishing stones act together, followed by a few seconds clean-up with the finishing stones acting alone. Time required is 10 seconds. The motions consist of rotation of the stones at 154 r.p.m. and a ¼-in. oscillation 550 times per minute.

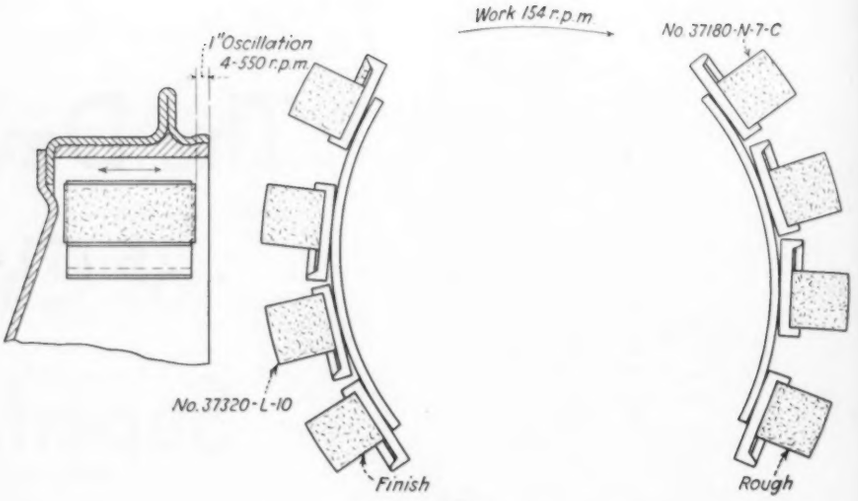
Separate motor drive for the brake drum machine is actuated by the two safety push buttons at operator's shoulder height, but the cycle is automatic.

Comparative finishes are shown in Fig. 19, which shows a brake drum after turning with 0.022 in. feed and after Superfinish. Photo-micrographic evidence of the improvement is shown by the inserts on the photograph.

Brake shoes are finished in pairs, assembled complete with hydraulic wheel cylinders and dust shields. Stone holders and stones could not compress radially around the shoes because of interference with the upturned flange of the dust shield. This problem was solved by designing fixed tool holders which come into the work at an angle. The brake shoes themselves are pressed lightly against the stones by the regular hydraulic brake mechanism, which are pneumatically operated for this special purpose.

One of the most common applications of Superfinish is on cylindrical exteriors such as the piston pins, which are shown in Fig. 20, and the valve stems which have been illustrated previously. Adjustment of the cycle on this machine has produced parts with an average surface smoothness less





AT LEFT

FIG. 17—Single-spindle Superfinisher for brake drums is self-contained unit with separate motor drive, pneumatic lift for the fixture and automatic work clamp. Coolant reservoir is in the rear of the machine base and has filter. Shield surrounds the work during operation; safety controls are used.

ABOVE

FIG. 17A—Holders for the two sets of brake drum stones are shown here. Rough and finishing stones are used, acting independently but with part of the cycle overlapping.

than half a millionth of an inch. Each of the rotating disks has a slightly different speed traveling in opposite directions (136 and 128 r.p.m., for example). A radial oscillation of ⅛ in. is maintained to get the required multiplicity of motions. Any short, straight, round pieces such as light shafts, needle bearings, spindles or rolls can be finished similarily, even parts with heads larger than the surface to be Superfinished.

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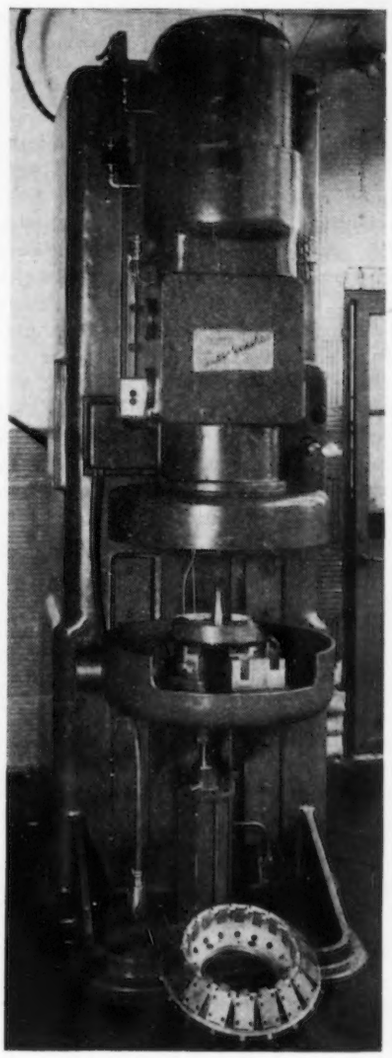
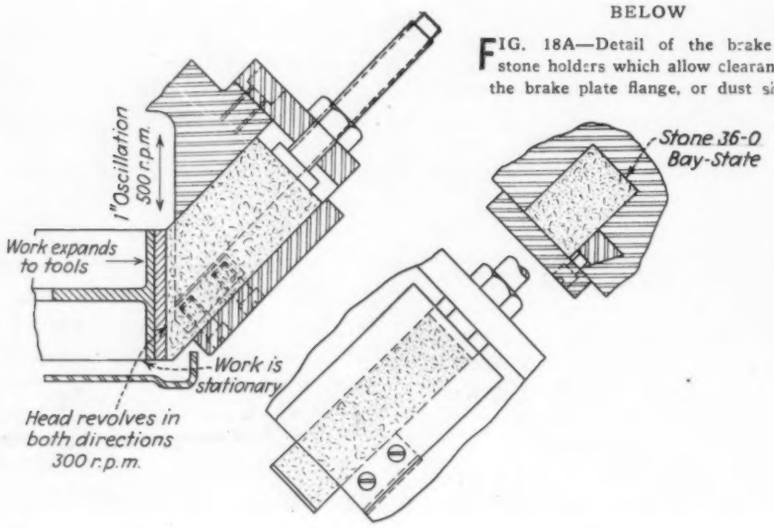


AT RIGHT

FIG. 18—The complete brake shoe assembly is put into the Superfinisher, and the brake hydraulic system is connected with an air line. Compressed air actuates the mechanism and expands the shoes against the stones. The entire set of stones is shown at the base of the machine.

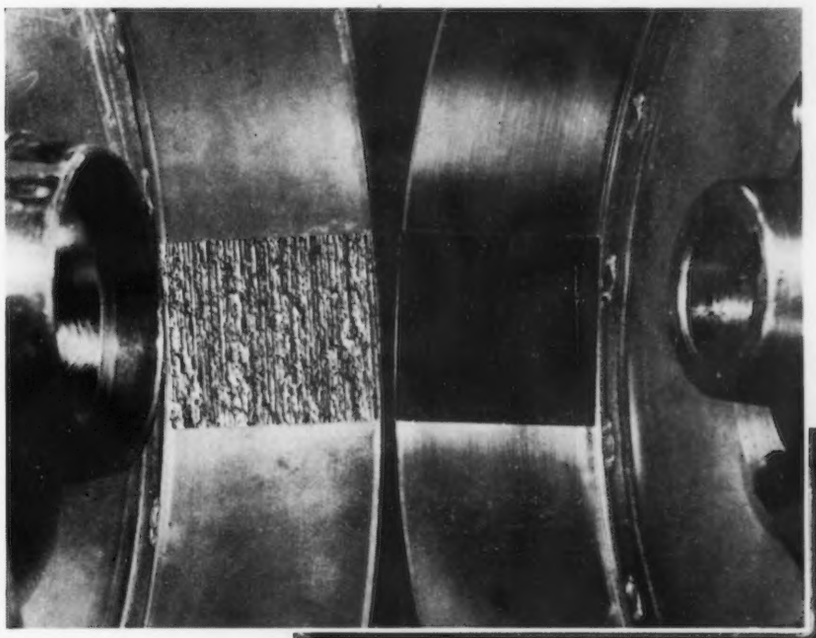
BELOW

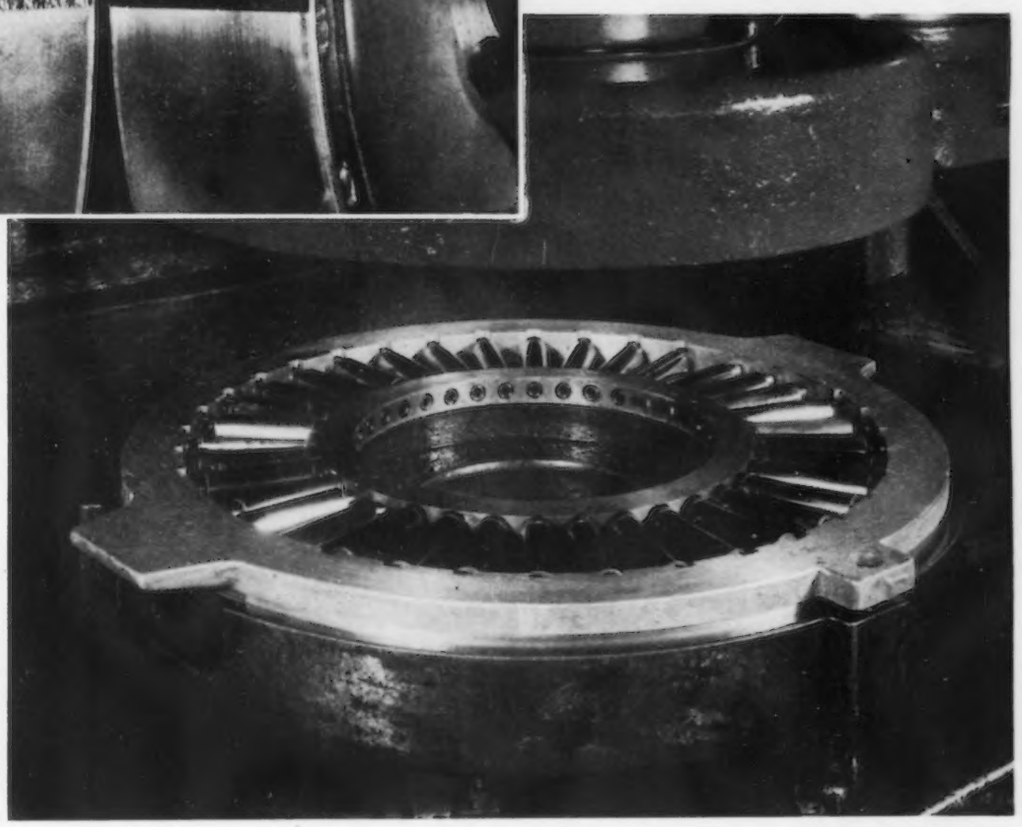
FIG. 18A—Detail of the brake shoe stone holders which allow clearance for the brake plate flange, or dust shield.



A recent development is the finishing of cam contours by Chrysler's method. This, it has been learned, requires a relatively low speed rotation of the cam shaft (22 r.p.m.) while the stone grinding wheel revolves 800 r.p.m. and the camshaft oscillates lengthwise ⅛ in. 230 times per minute. Midway in the cycle, the camshaft reverses its direction of rotation. See Fig. 22 and 22-A.

The feat of ringing together two 10-in. disks of steel, getting the two to adhere like gage blocks, has been achieved at Chrysler Corp. with surfaces Superfinished. These smooth flat surfaces were obtained by polishing each block separately on a special Superfinisher for flat surfaces. Five distinct primary motions and speeds are involved, producing a constant change in resultant motions and speeds, the result being a geometric pattern which insures smooth flatness.





ABOVE

FIG. 19—Product improvement shown graphically (insert micrographs magnified to 25 diameters). At left is turned brake drum surface with 0.022 in. feed, giving a surface roughness of 110 micro-in. At right is the Superfinish, to 2 micro-in. Only 10 sec. time is required to attain this smoothness.

o o o

AT RIGHT

FIG. 20—Typical setup for small cylindrical parts, such as piston pins. Essentially this is the same as the valve stem Superfinisher. Two disk stones, rotating in opposite directions, do this job.

In production, flywheels with diameters 14-in. and greater are Superfinished on the clutch face area to give a 10 micro-inch finish. Rough and finish stones are employed, each in turn oscillating a quarter inch 900 times a minute while the work revolves 174 r.p.m. (Fig. 23).

Chrysler Corporation's use of Superfinishing equipment in increasing quantities since investigaton was begun three years ago bears analysis to determine the manufacturing advantages of the process.

TIME REQUIRED:

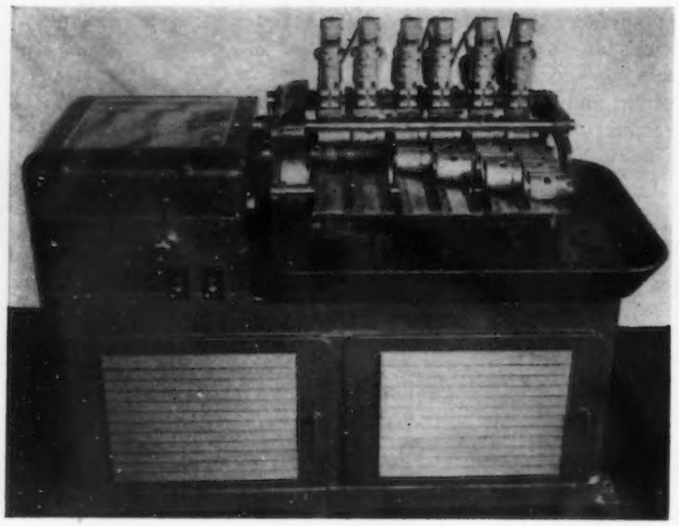
Records bear out the assertion that Superfinish produces a finer surface than has ever been possible mechanically and at the same time this surface can be produced with great speed. In Chrysler plants the average time of 10 Superfinishing operations is only 17 seconds machine time. The longest time for any operation is 30 seconds, and this produces a Superfinish of five micro-inches from a 50 micro-inch ground surface on all the main bearings and all pin bearings of an eight-cylinder crankshaft.

QUALITY OF FINISH:

Hundreds of thousands of parts finished in production to a Profilometer reading of less than 10 micro-inches is evidence in this score. An average of the Profilometer readings on all these parts is four to five micro-inches.

CONSISTENCY OF QUALITY:

Day-by-day checking with the Profilometer shows that Superfinish machines produce surfaces which never vary more than one or two micro-inches. Any run of parts of any quality can be produced with assurance



o o o

AT LEFT

FIG. 21—The piston machine is unique for its self-loading feature. Friction drive rotates the pistons; this can be seen under the two pistons at left.

o o o

that every part will be of predetermined smoothness.

COST OF OPERATION:

On this score it is declared that there has never been a Superfinish operation performed that has added any cost to the part being finished. There are many instances of decreased cost due to the refining of some operation previous to Superfinish. The perishable tool used in Superfinishing is a small stick abrasive, low in initial cost and with a life to produce hundreds, even thousands, of parts per set of stones.

MACHINERY:

Superfinishers used by Chrysler Corp. are self-contained machines, generally simple in construction. Down-time for changing stones is only a few minutes a day. Sticks of abrasive are set up in holders ready for the machine and are easily replaced. No stone dressing is required before the initial operations. In the event that stones have become loaded, the relatively rough surface of the next part to be Superfinished will clean up the stones at the start of the cycle.

INSPECTION OF PREVIOUS OPERATIONS:

Tool chatter marks or other irregularities resulting from previous operations are revealed glaringly after the first few strokes of the Superfinisher. In the case of numerous parts such as flywheels, valve tappets, camshafts and brake drums, this has resulted in correction of previous operations, generally at no cost, thus adding to the improvement of the manufactured product. In the case of brake drums, for instance, it resulted in a faster turning operation, previously referred to, which lowered costs for tools and machining time, as well as improving the character of the surface.

In the illustration, Fig. 24, a series of engine flywheels are shown at various stages of manufacture. The first is a surface turned on a new three-spindle lathe. The second is a ground surface with an average roughness of 32.5 micro-inches. The first few strokes of the superfinishing stones brought out numerous irregularities, as shown in the third finished part. In an instance like this, the unsatisfactory part could be re-ground to eliminate the ob-

FIG. 22—Cam contour Superfinishing is a recent development. The stone, five times the base diameter of the cam, rotates many times more rapidly, while the cam also oscillates.

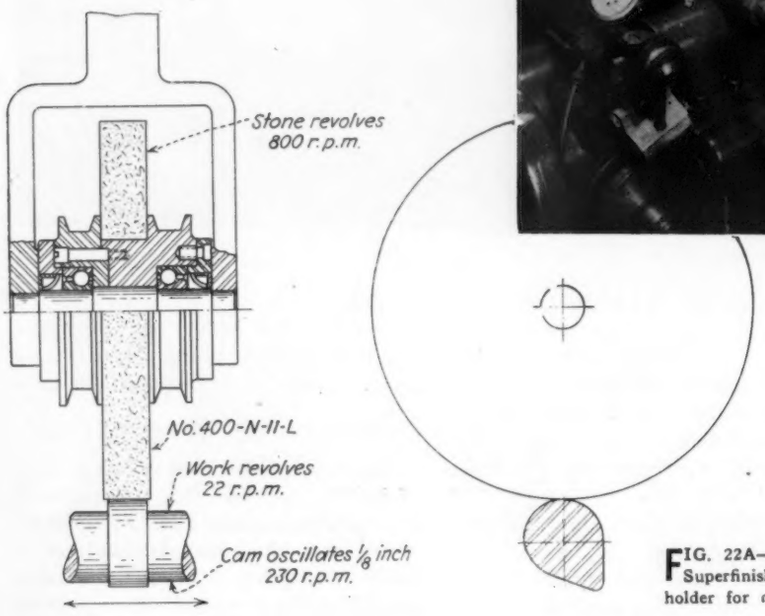
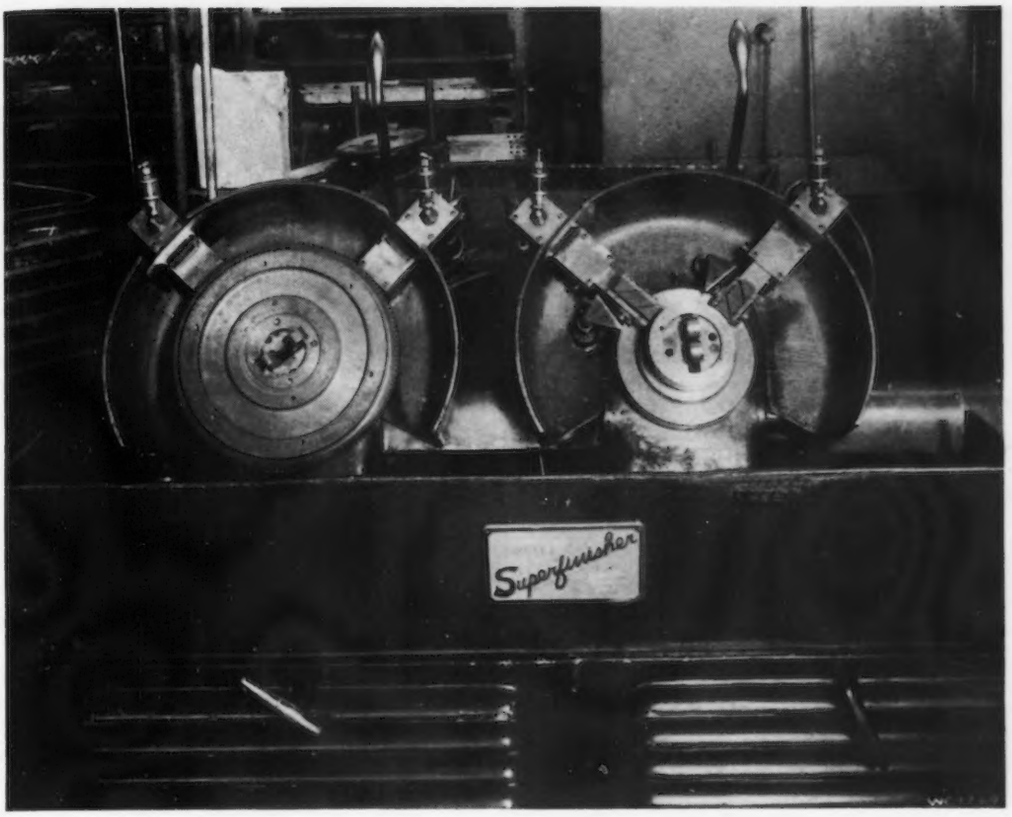


FIG. 22A—Detail of Superfinishing stone holder for cam work.



AT RIGHT

FIG. 23—One case where both the rough and finishing stones operate simultaneously, the flywheel Superfinisher. The setup proves satisfactory, producing a 10 micro-in. finish. Details of the stone holders, lubricant spray nozzles, Hi-cycle motors and work clamps are observable.

BELOW

FIG. 25—Improvement from 16 - 18 micro-in. to 1 - 2 micro-in. in surface smoothness doubled oil film strength and load bearing capacity in this Chrysler test.

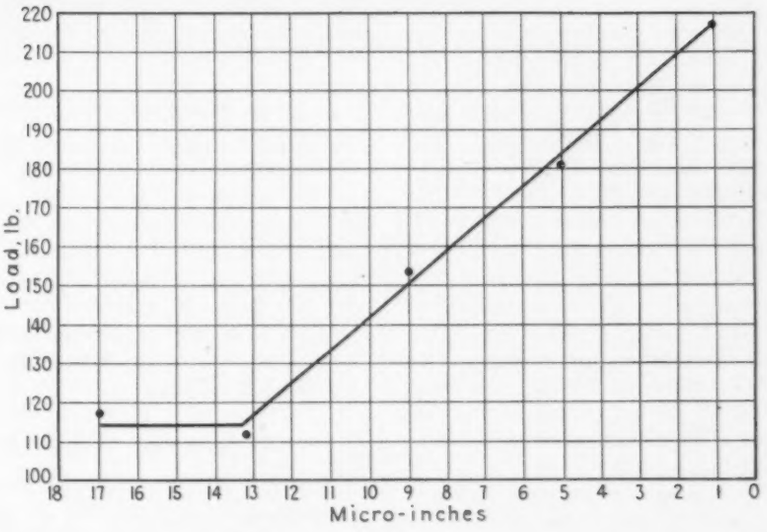
jectionable flaws in the surface. A flywheel, Superfinished in regular production to an average smoothness of 10 micro-inches, is shown at the far right.

Oil Film Strength

The ability to support and maintain an oil film under load probably is one of the most controversial aspects of the argument about smooth finish. Although previously proved, it has been argued again and again by people viewing Superfinish for the first time. It is a well-known fact that properly lubricated metallic surfaces do not score and gall unless the oil film fails. Bearing this in mind, Chrysler Corporation demonstrated in its laboratory that the pressure necessary to produce oil film failure increases as the roughness of the part decreases. Heavy, safe loads can be carried on Superfinished bearings and the load bearing capacity increases in proportion to the degree of Superfinish on the parts.

A standard SAE oil testing

(CONCLUDED ON PAGE 90)



BELOW

FIG. 24—Four flywheels provide comparison of surface finishes. From the left, the first has been turned on a new three-spindle lathe; the second ground to a smoothness of 32.5 micro-in. Partially Superfinished, the third shows many defects; one of the advantages of the process is the tendency to inspect the quality of previous operations. The fourth is Superfinished to 10 micro-in.

THIS WEEK ON THE

. . . Competition to be keen in low price auto field . . . New Ford models to fill out line and cover entire market . . . Production curve slumps as strike hits body plant . . . Sloan optimistic about business prospects for 1939.

DETROIT.—The automobile industry's lowest price field, where competition always has been keenest and business best, is seeing the development of a much more competitive condition. The Big Three are discovering as fall show dates draw near that their domain has been invaded by several of their more c'assy competitors of former years. Ford and Chevrolet, which for the last few years have built 85-hp. cars on 112 and 113-in. wheelbases, find, for instance, that Pontiac is building a light six on a 115-in. wheelbase and Oldsmobile is ready to sell a 90-hp. light six-cylinder car. The prices wi!l be low on these new cars—probably not many dollars above the Chevrolet or Ford figures.

In additio.a, Ford is protecting its interests by what might be called an attack from above. Ford will introduce a 95-hp. car on a 116-in. wheelbase, the "baby" Zephyr to sell in the $900 class. A'so it has recently been divulged that a bigger Zephyr is on the way. Possibly it will not be ready for introduction until the first of the year, but when it is announced it will supplant the aristocratic Lincoln, leaving that car to be built only "on order."

Ford's Plans Are Laid

Recent developments at the Rouge are here summarized: The 60-hp. car, which on'y a few weeks ago was said definitely to be out of the picture for next year, has been given a new lease on life; Ford also will produce an 85-hp. Standard and an 85-hp. Deluxe, as well as the 95-hp. Deluxe referred to previously.

The initial budget at the Rouge indicates at least the proportions in which these cars wil! be built. Plans call for the first run to total about 92,000 passenger cars and 18,000 commercial cars and trucks. Only about 9000 of the 60-hp. cars will be produced and they will be on a 112-in. wheelbase, as at present. About 22,000 of the 85-hp. Standards will be bui!t and 52,000 of the 85-hp. Deluxe cars are scheduled. The initial run of the 95-hp. cars will total only 10,000. The majority of the trucks built will be the 85-hp. commercial cars and trucks (about 7500 each). Around 2000 of the 95-hp. engines are scheduled for use in trucks. The initial run of Zephyrs will total 5000.

Ford assemblies are not yet under way, although everything is said to be ready for a rapid start. However, less than 4000 engines were built during the first half of September and it is unlikely that car assemblies will be started until a much larger bank of engines is built up.

Three New Cars Previewed

The new Oldsmobile, Pontiac and Graham cars were previewed during the last week by the press. These cars exemplified some of the 1939 trends very clearly. All of them had concealed hinges supporting the doors (Graham introduced this feature a year ago). Ventipanes used in General Motors no-draft ventilation system are equipped with sliding bolts on the inside to lock them. Rear quarter windows open by sliding backward, instead of being hinged as has been common. The "wobble stick" gear shift has almost completely disappeared and a mechanical shift lever mounted on the steering column is common this year. Ride characteristics got a lot of attention in the engineering departments; rear coil springs and a variable rate leaf spring are among the solutions offered.

The case for evolutionists is almost proved by looking at this year's running boards. General Motors cars will still offer these appendages if the customers insist, otherwise, the car is equipped with just about half a running board. It is a rubber-covered strip only about three inches wide along the side of the car. Graham engineers finally decided that they were useless and have left them off entirely.

Without running boards, or with half-width treads, the lower front part of the rear fender is exposed to flying stones, or scratching from shoes as passengers climb in or out. This has been taken care of in a number of designs by covering that section of the fender with a rubber shield.

An entirely new body model will be introduced by Graham at the Auto Show. It is a "combination coupe" which is being developed by the Murray Corp. From the side it looks like a close-coupled two-door sedan. It will seat three passengers in the front seat and three in the rear.

Strike Affects Plymouth Assemblies

The anticipated gain in last week's production of passenger cars and trucks was blocked by a strike at Briggs Mfg. Co., which began Wednesday of last week and prevented delivery of bodies to Plymouth, resulting in suspension of work by Plymouth. As a result, last week's production was only 16,100 units, against 17,485 the previous week and 30,150 a year ago at this time, according to Ward's Automotive Reports. Neither Chevrolet nor Ford is assembling cars, so Plymouth production bears extra weight in the industry's totals at present.

With General Motors' president, Wi'liam S. Knudsen, off to Europe and Alfred P. Sloan, board chairman, just returned to this country, General Motors officials have a first-hand idea of the seriousness of Europe's war threat. Before Mr. Knudsen left, he is reported to have expressed the

ASSEMBLY LINE

By W. F. SHERMAN
Detroit Editor

opinion that war would not break out this fall because the records show that wars start after the harvest season, when men are free, but never late in the fall because dictators know that soldiers don't like to sleep on cold ground.

Sloan is Optimistic

Mr. Sloan made an unexpected appearance at the Pontiac preview, arriving almost as the speaker's table group arose to leave the room. At this session, and a day earlier at a Buick sales meeting, he was extremely optimistic, declaring that a tremendous potential demand for goods and services existed and that he looked for an improvement in business for 1939.

"There is statistical evidence that consumers are again willing to buy," he said. "Following sub-normal efforts of industry through 1938, up to say August, we had undoubtedly reached a state where consumption was in excess of our production. Therefore things had to get better. That is the reason I believe a considerable increase is to be expected, especially from the standpoint of consumer goods," Mr. Sloan declared. "It seems to me that the thing that will influence its magnitude and continuation more than anything else is the extent to which the better business indirectly stimulates the capital goods industry." He added, "Speaking in a broader sense, the American production plant is obsolete."

As though to explain his outlook, Mr. Sloan said, "I am an optimist in a fundamental sense, not in a superficial sense," and he pointedly referred to the "nine to zero score of the Purge."

Sloan's optimism is indicative of a new spirit obvious throughout the industry as plans for next year are disclosed. A year ago executives were frankly pessimistic. This year their aggressiveness is shown in their speech, in the presence of many of the top officials at previews and in the extensive advertising campaigns that are being prepared, as well as in new designs which in most cases represent large investments in dies.

H. J. Klingler, Pontiac general manager, touched on the advertising phase of the business. For years it has been an industry-wide policy to advertise heavily when business was good, but to go easy during bad times, on the basis that there is no use "using good bait when the fish aren't biting." This year, with recovery apparently imminent, the majority of advertising departments are cutting lose with increasingly large appropriations in an attempt to get the business which the industry feels is coming to it this fall.

Machine Tool Dealers at Cincinnati Oct. 10 and 11

THE annual convention of the Associated Machine Tool Dealers of America will be held at the Hotel Alms, Cincinnati, on Monday and Tuesday, Oct. 10 and 11.

This organization represents machine tool dealers from coast to coast. Its president is A. G. Bryant, Bryant Machinery & Engineering Co., Chicago; vice-president, John Sauer, Jr., Peninsular Machinery Co., Detroit; secretary and treasurer, E. P. Essley, E. L. Essley Machinery Co., Chicago; executive secretary, Thomas A. Fernley, Jr., 505 Arch Street, Philadelphia.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

VERTICAL

This die set, consisting of a die, die shoe, punch and stripper, has an intricate outline and many sharp corners. The Vertical Shaper produced it without difficulty, and saved 55½ hours or 75%.

"the handiest machine in the shop"

For complete information and literature write to

PRATT & WHITNEY

Division Niles-Bement-Pond Co.

The irregular contour in the die and die shoe shown at the left was machined on the P&W Vertical Shaper in only 8¼ hours. This represented a saving of 34¾ hours or 80¾%. The angular adjustment of the ram of the P&W Vertical Shaper permits machining relief on dies directly without any special jigs or fixtures. Why not investigate the savings this machine can make in your shop?

6 INCH 12 INCH SHAPERS

THE PRATT & WHITNEY VERTICAL SHAPER is one of the handiest machines ever built. It will cut all sorts of irregular shapes, often without a single time-killing change in setup. It enables any good machinist to finish those special jobs quickly.

The Pratt & Whitney Vertical Shaper is being used by a wide variety of industries. It is in toolrooms everywhere, shaping out the special fixtures and tools needed in almost every manufacturing process. It is used in die shops, railroad repair shops, general repair shops and many others. It has well earned its name of "the handiest machine in the shop."

Of particular and important advantage to the die shop is the angular adjustment of the ram on Pratt & Whitney Vertical Shapers. This permits machining the relief on dies directly, without any special jigs or fixtures.

Notice the complicated designs of the various dies shown on these two pages. Any one of them presents a difficult contour job to machine by ordinary means. The Vertical Shaper will turn out these shapes easily, cutting the relief at the same time. The angular ram adjustment takes care of that.

Send for our illustrated literature and complete information on the P&W Vertical Shaper, "the handiest machine in the shop."

7¼ hours or 63% over previous methods were saved when a P&W Vertical Shaper was installed in a die shop and produced this die and stripper.

"the handiest machine in the shop"

The P&W Vertical Shaper is available in two sizes, with a 6" ram stroke (illustrated above) and a 12".

Hartford, Conn., U.S.A.

The actual savings effected in die shops by the P&W Vertical Shaper are tremendous. One customer who produces many small blanking dies states that he saved 60% of his former time on die work, of which 20% was a saving in labor alone.

THIS WEEK IN WASHINGTON

. . . Collapse of New Deal purge helps business, with next Congress less likely to be rubber stamp for Roosevelt . . . Supreme Court finds important labor cases involving sit-down strike, contract-breaking up for settlement.

o o o

By L. W. MOFFETT
Resident Washington Editor
The Iron Age

o o o

WASHINGTON. — Failure of the New Deal purge undoubtedly has had a stimulating psychological effect on business.

The improved feeling is based on the belief that the next Congress will be less of a rubber stamp than its majority has been since 1933 and more of a really legislative body now that they have seen constituents sharply repudiate the bidding of the President. There is the thought that the next Congress may be expected to be more courageous than it has been for more than five years and will oppose White House demands for widespread regulation.

Some hope that the White House itself, seeing its loss of prestige, will let up on its program of broad "reforms," take a less hostile attitude toward business and not only promise but actually effectuate a "breathing spell" that will permit the recovery movement to go forward.

Administration Not Predictable

However, the time long has passed when any degree of caution will justify a prediction of what the Administration may do. It has habitually done the unexpected and having this in mind there are many who think the habit has by no means been discarded by the crushing defeat of the purge program. On the contrary some contend that by reason of resentment over the defeat and a desire for a showdown, the New Deal may actually intensify demands on Congress for "liberal reform," regardless of the wide and growing dissension in the Democratic party—or, more correctly, the dissension between the New Dealers and so-called conservatives in the Democratic party. Nevertheless, the latter formidable group, some of whom had been marked for purging, and therefore increasingly hostile to many Administration policies, could, with Republican support, block the New Deal.

It is, however, quite possible that those who think that the failure of the purge has sharply shrunk Presidential power over Congress are oversanguine. And with some it may well be that the wish is the father of the thought.

For there probably is much force back of the contention that though his purge plea was a complete flop, the President is still extremely popular with a majority of the voters. No matter that a substantial degree of this popularity may be shared by millions who feed directly or indirectly at the public crib and is born of self-interest. The fact still remains that this popularity, purchased or otherwise, remains and reflects tremendous political power. It is altogether probable that repudiation of the purge means a diminution of Presidential popularity, but it is evident that it still is great and will continue to be high so long as the President has the vast power of the purse which supine Congresses have placed in his hand.

President Still Powerful

Until and unless that power is lessened it may be assured that the President will have a strong influence over Congress, even though it may be expected to be considerably more independent that heretofore. Nor is it to be overlooked that members of Congress, looking to their own political interests, are given to yield to Presidential demands in return for patronage they receive through huge funds under White House control.

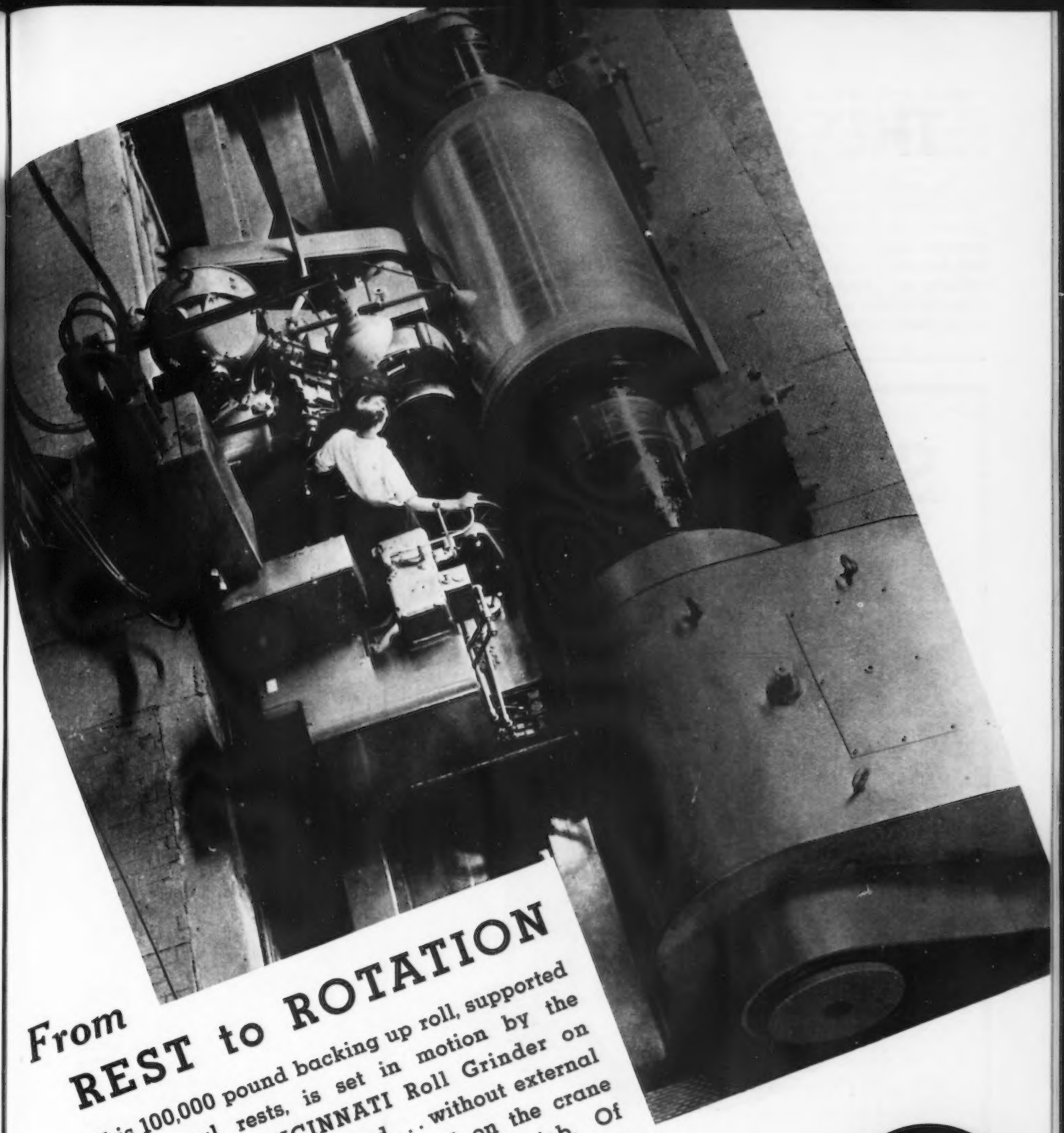
It becomes a question, therefore, of vital interest to business, whether Congress will have the courage to insist upon Federal economy. Should it do so and succeed it is certain that Presidential power will be greatly reduced and relief for business with a start toward genuine rather than subsidized and temporary recovery will be achieved, provided business, or important segments of business itself, quits its habit of coming to Washington and demanding regimentation even as it assails New Deal planned economy.

Fortunately there is a prospect, though no assurance, that the next Congress will drive for real Federal economy, rather than contenting itself with idle promises of going easier on the treasury and on a minority of direct taxpayers who are called upon to support a growing number who are Government-supported, a condition that must be halted if Government-bankruptcy is to be avoided. After five years of unexampled legislative "cures," unprecedented expenditures of some $17,000,000,000 which have piled up an all-time record national debt of $40,000,000,000, higher and still higher taxes, with 11,000,000 idle workers, a huge and ever-growing, unwieldly bureaucracy, the New Deal finds its extremely costly structure of "recovery" was built on quicksand, its pump priming a failure, except as a political vehicle, but obviously does not concede the fact. Meanwhile, some $48,000,000,000 in credits lies idle in the banks seeking but unable to find sound investment because of New Deal policies, including its hostility toward business.

Some Realize Situation

There are conservative Democrats who are acutely aware of this situation and are eager to correct it, and are said to be planning to do something about it at the forthcoming session of Congress. This is seen in the demand of Senator Pat Harrison of Mississippi, who will unquestionably again head the Finance Committee, for Federal economy.

He and the President came to grips at the last session over the undistributed profits tax and the Senator, seeking to encourage business, all but



From REST to ROTATION

This 100,000 pound backing up roll, supported on journal rests, is set in motion by the 60" x 240" CINCINNATI Roll Grinder on which it is being finished . . . without external aid. It's not necessary to call on the crane service to help this machine do its job. Of course, there are many other important characteristics of CINCINNATI Roll Grinding Machines. Write for full particulars.

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CINCINNATI

A SYMBOL OF A DEFINITE STANDARD OF WORTH

wrecked the tax plan on which Roosevelt insisted. His victory over the White House plus the defeat of the Presidential purge gives Harrison added power to direct tax and economy legislation just as he and other conservative Democrats in both branches of Congress will be in a stronger position to block Administration regulatory legislation which chills business and retards recovery. It remains to be seen whether and to what extent that power will be exercised.

Supreme Court Finds AFL-CIO Cases on Fall Term Calendar

WASHINGTON. — Three months before the 76th Congress convenes in a session which will face renewed and intensified agitation for revision of the Wagner Labor Relations Act, the Supreme Court may be asked to review a score of NLRB cases revolving around the three-year-old split between the AFL and the CIO, the controversy surrounding the sit-down strike, and the question of whether workers can receive the protection of the Labor Board after breaking an anti-strike agreement.

When the high court meets for its fall term early in October, it will have cases involving two of these points before it and the others are expected to be filed for review before the court convenes or later in the fall term.

Of the two NLRB cases already on file, one covers the Consolidated Edison Co., of New York, involving Labor Board invalidation of a closed-shop contract covering some 28,000 workers—an NLRB step which went a long way to alienate the AFL. Several other similar decisions followed the Consolidated Edison case, but of the others, none is before the Supreme Court.

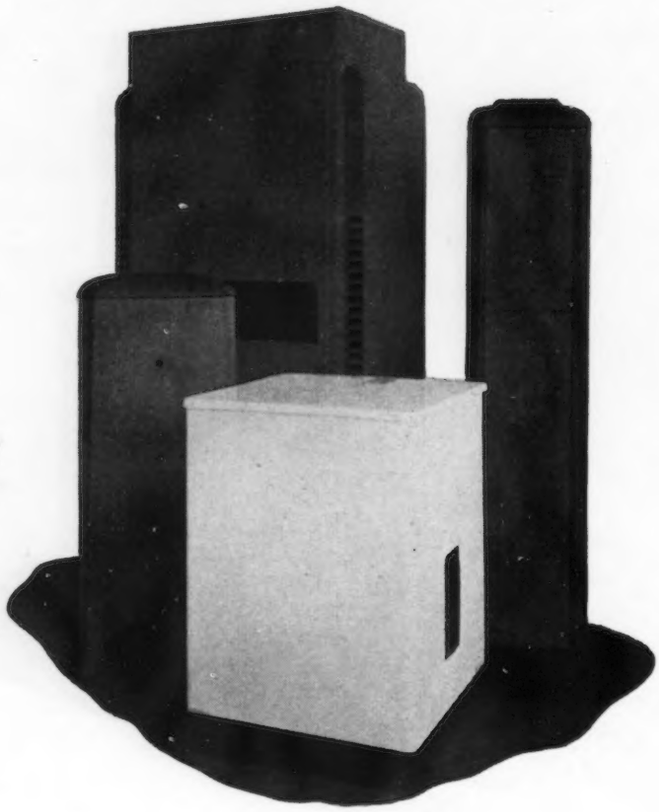
Contract Violation Up

The other pending case already brought to the high court for review is that of the Columbian Enameling & Stamping Co., where the employees' claim of the right to strike in violation of a no-strike agreement is the question at issue. In this case the NLRB has petitioned the court to rule that striking employees, even though proceeding in violation of an agreement with their employer, forfeit neither their employee status nor the protection afforded by the Wagner Act.

The Circuit Court of Appeals at Chicago ruled against the board, pointing out that a strike in violation of a collective bargaining agreement severed the employment relationship and put an end to company responsibility to bargain with the strikers.

The CIO sit-down strike technique will be directly at issue if the court is asked to review the case in Chicago in which the NLRB ordered the Fansteel Metallurgical Corp. to reinstate CIO sit-down strikers. Here again the Circuit Court of Appeals in Chicago ruled against the Labor Board, sustaining the company's claim that sit-down strike participation by employees and injury of company property removed the necessity for rehiring the strikers. The NLRB is generally expected to appeal the case to the Supreme Court.

STAMPINGS



YORK offers the latest type facilities for producing formed or deep drawn stampings of all kinds.

A complete service on tool and die designing is at your command.

Write us about your requirements.

YORK CORRUGATING CO.

YORK, PENNA.

Indications also point to a substantial number of NLRB cases coming up for consideration in Federal appellate courts, a good many of which presumably will involve AFL and CIO rivalry. While the board has thus far fared well in Supreme Court decisions, it has encountered a growing number of adverse decisions on judicial review in the lower courts. These setbacks include the rulings that: (1) NLRB members are required to answer questions pertaining to the procedure by which they arrived at findings in decisions against employers; (2) employer may not be held in contempt for failure to obey court decree enforcing NLRB order which is ambiguous and misleading; (3) certain manufacturing processes do not affect interstate commerce and hence do not come under board jurisdiction; (4) orders supported only by "hearsay and non-expert-opinion evidence" are not enforceable; and (5) no substantial evidence supports a decision that a union limited to employees of a single employer is "a company union" within the law's definition.

AFL Protest Case Scheduled

One case regarded as significant and indicating the extent of the current bitterness between the two labor factions is the action taken in the Federal District Court in Philadelphia by the AFL's International Molders Union, which petitioned the court for a mandatory injunction against the Labor Board. The court was told that members of the AFL's molders union did not participate in an NLRB election last spring at the Roberts & Manders Stove Co., and the Hatboro (Pa.) Foundry Co., which led to recognition of the SWOC as the collective bargain group. The AFL union, which claimed to have a higher wage rate than the CIO group, subsequently petitioned the Labor Board for an investigation aimed at seeking certification for itself as the bargaining agent. Counsel for the union charged that the NLRB threw out the request without calling a hearing.

The case is regarded as unprecedented although NLRB officials are minimizing its importance as they frequently do where AFL-CIO disputes are involved in proceedings affecting the Board. The Labor Board itself is being closely watched in an effort to learn if the Board, possibly fearing AFL pressure against it during the next Congressional session, will swing more in favor of the Federation's unions in future decisions. After President William Green's support of Wagner Act revision, his bitter criticism aimed at Board Member Edwin S. Smith and his recommendations against the reappointment of Member Donald Wakefield Smith, there were some indications that the Board might alter its policy of showing strong bias in favor of the CIO.

Revision Uncertain

Although William Green has insisted that President Roosevelt had given the assurance that "clarifying" amendments to the Wagner Act are favored by the Administration, it is not generally believed that the New Deal is ready to go far, if at all, in the direction of seeking amendments desired by industry. The Senate's reaction to the Donald Smith appointment, when his name comes up for confirmation in January, will provide the first test vote as to whether the trend in Congress points in the direction of Wagner Act revision.

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BETTER JOB CHEAPER

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A Massachusetts company was faced with a specific metal cleaning problem. They found that they had to use a solvent before the cleaning bath to remove a stubborn fabricating compound prior to finishing.

A Wyandotte Service Representative surveyed the job and suggested one of the Wyandotte Metal Cleaners. When it was used, the pre-soak was no longer necessary. Result: Nearly a 50% saving in labor *plus* a saving on total costs of cleaning material.

This, of course, is a special case. Most metal cleaning jobs are. And in most cases Wyandotte's line of specialized metal cleaners will help you do your job better, more quickly and more economically. Write or telephone to have a Wyandotte Service Representative call.

See the Wyandotte display at the National Metal Exposition — Detroit — October 17-21 — Booth C309.

THE J·B·FORD COMPANY

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DISTRICT OFFICES IN 26 CITIES

FTC Charges Florida Builders' Monopoly

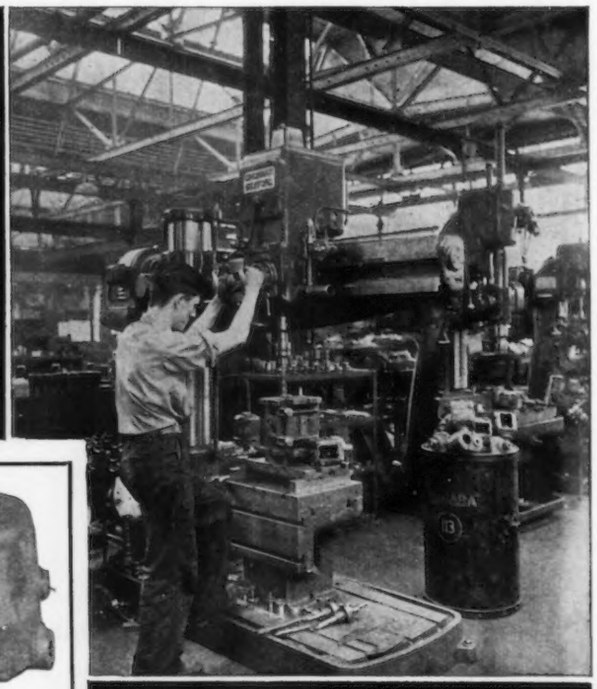
WASHINGTON. — The Federal Trade Commission has issued a cease and desist order against the Florida Building Material Institute, Inc., of Orlando, Fla., charging unlawful practices in restraint of trade, elimination of competition and other monopolistic practices in the sale of lumber, lumber products, building materials, builders' supplies and millwork.

The commission said that the institute, organized in 1934 and composed of 280 active dealer members representing about 70 per cent of the purchasing power of Florida lumber and building materials purchases, was found to have adopted a definition of a dealer which was published and distributed in a circular entitled "distribution policy." Any person or concern seeking active membership in the Institute, the FTC said, had to qualify in accordance with the definition.

The cease and desist order prohibits, among others, these alleged practices:

(1) Publishing bulletins and other data containing names of members for the purpose of indicating that manufacturers, producers and wholesalers should confine their sales to members and recognized dealers; (2) seeking information covering sales made by manufacturers, producers and wholesalers to non-member dealers or non-recognized dealers; and (3) using boycott or intimidating persons from continuing business relations with non-recognized buyers; and (4) holding meetings to devise means of making the institute's program and policies effective.

HIGH SPEED "All Geared" SUPER-SERVICE RADIAL DRILLS



THE JOB

Drill and Tap ½" hole
Drill and Tap 35/64" hole and thread with 35/64 by 18 thread
Drill and Ream 2-⅜" holes
Drill and Spot Face 1-⅞" hole
Drill and Spot Face 1-¾" hole
Drill and Tap 2-¼" x 20 thread holes
Drill and Tap 2 ⅜" holes
Drill 2-⅛" oil holes
(Depth of holes drilled varies)

Niagara Machine & Tool Works drills, taps, and spot faces, and reams to limits of ± 0005"

Here is another Super-Service Radial Drill, demonstrating precision performance on a wide range of operations. The Niagara Machine & Tool Works, Buffalo, N. Y. is the user in this case . . and this is but one of their 9 Super-Service drilling machines.

The piece being machined is a cast iron frame for a combination machine.

Floor to floor time is 16 minutes per piece—a saving of 4 minutes over former methods. Accuracy is maintained within limits of ± .0005".

Small wonder Cincinnati Bickford Super-Service Radials are widely used for speeding up production and insuring high precision in leading shops. Get all the facts.

The CINCINNATI BICKFORD TOOL CO., Oakley, Cincinnati, Ohio

Pig Iron Output Shade Higher in Czechoslovakia

WASHINGTON.—Pig iron production in Czechoslovakia in July, 1937, according to information received by the Commerce Department. in June, 1938, and 139,000 tons in July, 1937, according to information received by the Commerce Department.

The July steel ingot output dropped 11.5 per cent to 154,000 from the June figure of 174,000 metric tons. The July total was 23.8 per cent lower than the 202,000 tons produced in June, 1937. Cumulative production figures for the period from Jan. 1 through July 31, 1938, showed a total production of 810,000 tons of pig iron and 1,147,000 metric tons of steel ingots, a decrease of 14.4 per cent and 12.2 per cent, respectively, against the corresponding period of the abnormally active year of 1937 when 946,000 tons of pig iron and 1,307,000 tons of steel ingots were produced.

Projectile Order to Crucible Steel Co.

WASHINGTON. — The Walsh-Healey Government Contracts Board for the week ended Sept. 15 reported the following contracts, among 92 awards totaling almost $5,000,000, granted by various Government departments:

Crucible Steel Co. of Amer., projectiles	$332,100
General Fireproofing Co., steel furniture	108,000
Automatic Sprinkler Corp., sprinklers	52,000
Bethlehem Steel Co., steel bars	82,643
Lehigh Structural Steel Co., structural steel	28,965
Chase Brass & Copper Co., copper tubing	9,897
American Bridge Co., structural steel	17,053
Alan Wood Steel Co., plates	23,015
Carrier Corp., refrigerating plants	21,581
Russell, Burdsall & Ward, bolts and nuts	10,575

Steel Rail Rates in Mid-West Protested

WASHINGTON.—Addison Miller, Inc., and Fielding & Shepley, Inc., engineering contractors, have filed a complaint with the Interstate Commerce Commission against the rate of $1 per 100 lb. from the Chicago district and 90c. per 100 lb. from Duluth and Steelton, Minn., plus an emergency charge of 2c. per 100 lb. to Wiola, Minn., on iron and steel products. The commission is asked to establish reasonable rates and to award the complainant damages of $7,000.

NLRB Orders Second Vote In Utah Plant for CIO

WASHINGTON.—The NLRB has scheduled a run-off election for employees at the Arthur and Magna mills of the Utah Copper Co., and the Kennecott Copper Corp., Salt Lake County, Utah, to determine if workers desire to be represented by the CIO's mine, mill and smelter workers union. A previous election was held Aug. 24 but the board said neither the CIO union nor an independent union of mill workers received a majority of the votes cast.

Steel Marketing Process in a Revolution, Scrap Leader Says

TENDENCY for steel mills poorly located as far as consumption outlets are concerned to fabricate more of their products was cited this week by Edwin C. Barringer, executive secretary of the Institute of Scrap Iron and Steel, as a result of the recent revisions in steel basing points.

"The best customers of the scrap industry are undergoing a revolution in their marketing programs due to the adoption of f.o.b. mill prices early in the summer," Mr. Barringer, former editor of *Daily Metal Trade*, told the institute at its mid-year meeting Sept. 12 at the Pennsylvania Hotel, New York.

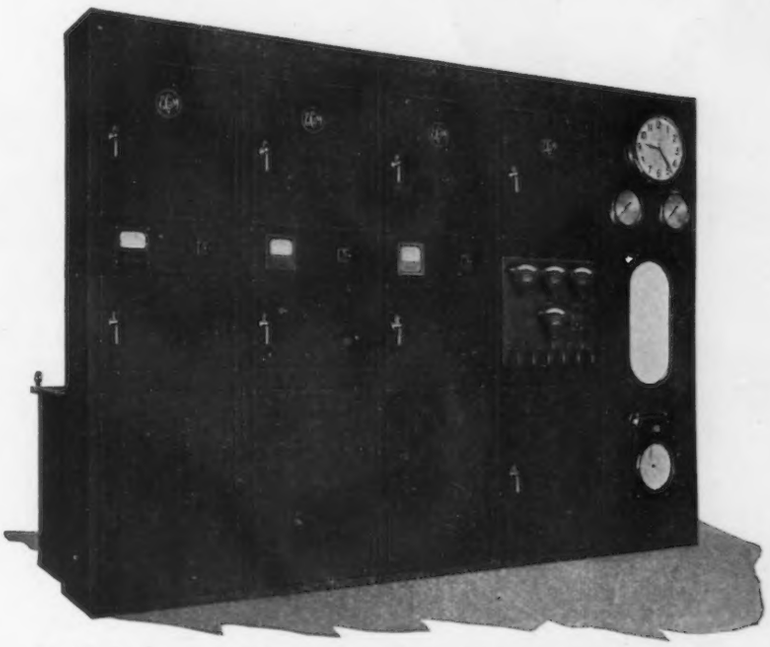
"Over a long period this should tend to pull facilities for production toward areas giving heavy consumption. But steel is literally a heavy industry; its large investments preclude swift transfers of facilities. And, in addition, there should be enough business over the next year or so to satisfy most interests. Any radical reaction will be slow to appear."

Industry is "smart to ride the tide" of social developments, the scrap executive said. "Right now we, in the United States, appear to be in the valley of indecision," he declared, "whether to traverse the road to complete socialization of industry or to retain the American system of private enterprise.

"Few who are not in close contact with Washington appreciate the scope of the program of certain forces at Washington who, for example, would set up cartels for steel and other basic industries, and place both capital and labor tightly in their grip."

Ferracute Machine Co., Bridgeton, N. J., announces appointment of the Giebel Machine Tool Co., Inc., 236 West 55th Street, New York, as representatives. The Giebel Machine Tool Co. will handle the entire line of Ferracute power presses for stamping, shearing, punching, coining, embossing, etc.

EC & M *Steel-clad* Motor Control



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for Fully Automatic Pumping Station . . .

LOOK at the neat, orderly arrangement of this EC&M Motor Control Equipment of Steel-clad construction. It has every advantage of safety and convenience. Doors are interlocked to prevent pulling disconnect switches under load and the dead-front construction provides a shock-proof installation.

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This is only one example of the outstanding installation that is possible with EC&M Steel-clad Motor Control. An illustrated, 16-page Booklet No. 67 gives complete information on typical installations of this control in coal mines, oil refineries, chemical plants and other industrial applications. Write for your copy today.

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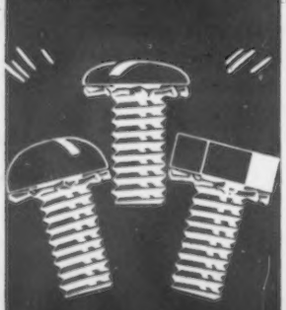

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. . PERSONALS . .

C. L. VOLKMAN, associated with the Pollak Steel Co., Cincinnati, for more than 20 years, has been appointed manager of the fence post division of the company. He will continue as manager of construction materials. He succeeds C. G. TALBOTT, who has retired because of illness.

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O. M. GIBSON, formerly metallurgist for the Dodge Brothers Corp., has been made research director of G. S. Rogers & Co., Chicago, in charge of all production-control and research laboratories of the company's Middle Western and Eastern plants. A graduate of the University of Detroit, Mr. Gibson was formerly field metallurgical engineer for the J. B. Ford Co., and latterly manager of the metal working research department of E. F. Houghton & Co., Philadelphia.

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FRED GROTTS, formerly vice-president of the Lebanon Steel Foundry Co., Lebanon, Pa., has joined the Chicago Steel Foundry Co., Chicago, as vice-president in charge of heat and corrosion resisting alloys. Mr. Grotts was at one time chief metallurgist for the Caterpillar Tractor Co., manager of the St. Louis steel wheel plant of the American Steel Foundries, and later in charge of alloy sales development at the Indiana Harbor plant of the Continental Roll & Steel Foundry Co.

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JAMES A. FARRELL, chairman of the board of the National Foreign Trade Council will be tendered a luncheon by a number of trade groups on Nov. 1. Included among the associations will be the American Arbitration Association, the Chamber of Commerce of the State of New York and the National Council of American Importers, Inc.

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HERMAN R. LARSON has been appointed central district service manager, Westinghouse Electric & Mfg. Co.'s Homewood, Pa., works. He succeeds ELMER SIMPSON, who becomes electrical superintendent of the central district.

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CHARLES F. LANTER, who has represented Pittsburgh Steel Co., and Northwestern Steel & Wire Co. in Texas, has been appointed assistant district sales manager of the Fort

Worth office of the Colorado Fuel & Iron Co., Denver.

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DON E. PERKINS, metallurgist and a graduate of the Case School of Applied Science, has been placed in charge of sales of pig iron, coke and foundry specialties in Detroit for the Kerchner-Marshall Co., Pittsburgh and Cleveland.

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CLAUDE J. BLACK, heretofore purchasing agent for the Indiana Limestone Corp., Bedford, Ind., has resigned to become purchasing agent for Indiana University.

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K. L. BRENNER has been appointed acting purchasing agent of the Wabash Railway Co., to take the place of T. J. FRIER, who has been granted leave of absence because of ill health.

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C. S. QUILLEN, who has been assisting with development work at the Rochester plant of the Mixing Equipment Co., has been placed in charge of field engineering for the company in New York and Central Southern territories. He will make his headquarters at 377 Broadway, New York.

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ELLSWORTH MCSWEENEY has become a research associate at Battelle Memorial Institute and is beginning a study of organic tin compounds. JULIAN GLASSER has joined the staff of the institute and is engaged in chemical and electrochemical research in metallurgy.

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DR. WILLIAM MONROE WHITE, manager of the hydraulic department of the Allis-Chalmers Mfg. Co., Milwaukee, gave a lecture illustrated with color pictures of a recent trip to India and the pyramids of Egypt at the September meeting of the Engineers' Society of Milwaukee at the Wisconsin Club.

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CHARLES W. PENDOCK, president of the Le Roi Co., Milwaukee, manufacturer of internal combustion engines, air compressors, etc., spoke on "Employee-Employer Relations" at the opening meeting of the new season of the Wisconsin chapter of the American Foundrymen's Association on Sept. 16.

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ALBERT D. PORTER has been named Cleveland factory representative for Fedders Mfg. Co., Inc., Buffalo, for the company's heating division. He

TWIN

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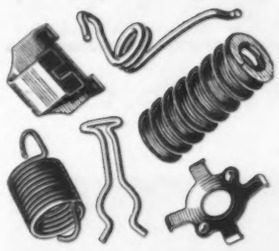
SPRING DELIVERIES



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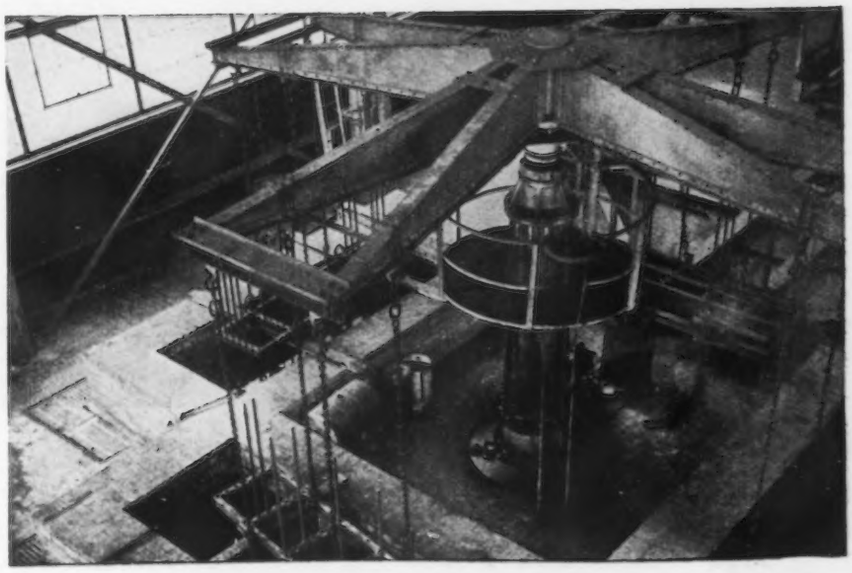

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recently installed with a Mesta Pickler in one of the large new sheet mills at Cleveland. Each tank is 20' long, 6' wide, 9' deep.

Construction is brick-veneered concrete shell with inner lining of acid proof brick and acid proof jointing cement BASOLIT—also available in combination with rubber lined steel tanks.

The installation illustrated is one of the many hundreds where BASOLIT has contributed toward long life and efficient operation of modern pickling equipment.

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will be located at 1836 Euclid Avenue, Cleveland.

❖ ❖ ❖

JOHN PEARCE has been appointed a member of the sales and service department of Pittsburgh Screw & Bolt Corp.'s Colona division. He formerly was sales and service engineer with the National Acme Co.

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CLAUDE A. MARLOWE has been appointed sales engineer for the A. W. Cadman Mfg. Co., Pittsburgh.

GEORGE JAMESON, supervisor of the order and stores department of the General Electric Co., West Lynn, Mass., who has completed 50 years of service with the company, was the guest of honor recently at a banquet tended him by his associates and friends. At the age of 13 years he started work as an office boy for Frederick W. Webster, then purchasing agent for the Thomson-Houston Co., a predecessor of the General Electric Co. VERDIE A. DODDS, of the Brown-Wales Co., was toastmaster at the banquet.

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GEORGE E. JUREY, for many years works auditor, Jones & Laughlin Steel Corp., Pitsburgh, has resigned, effective Sept. 3. Mr. Jurey entered the employ of Jones & Laughlin about 19 years ago, having previously been with the Republic Iron & Steel Co., Youngstown.

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J. R. FUNK, service engineer in Oklahoma and Texas, for the Landis Machine Co., Waynesboro, Pa., left on Sept. 3 on a trip through South America where he will service the company's machines in the oil fields and industrial shops. His work in Oklahoma and Texas will be taken over by W. B. BAKER.

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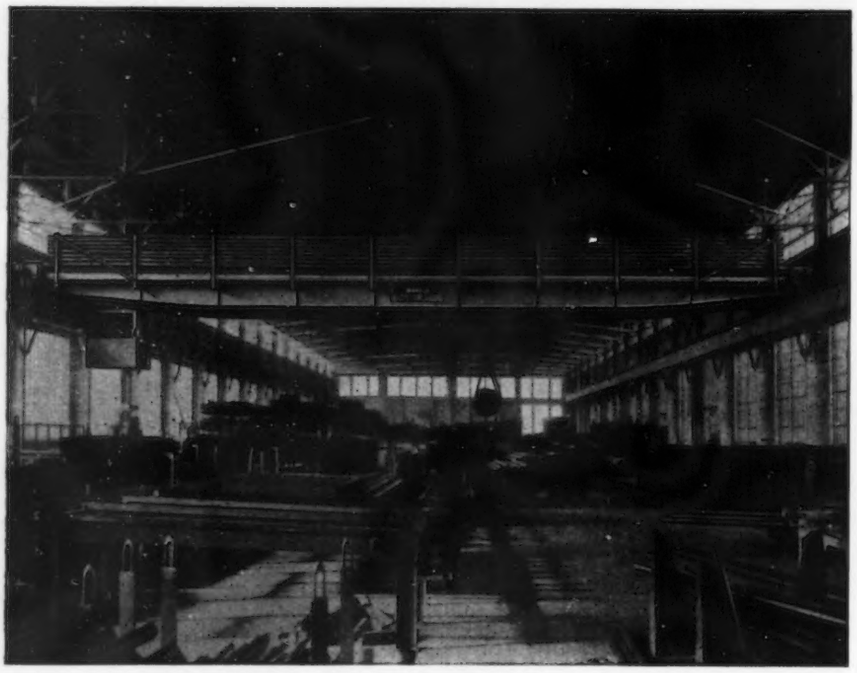

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MATERIALS HANDLING EQUIPMENT

10,000 Expected To Attend Safety Council's Jubilee

CHICAGO will be host Oct. 10 to 14 to what is expected to be the largest safety session ever held. More than 10,000 men and women are expected to assemble in the Stevens Hotel as delegates to the National Safety Council's Silver Jubilee Safety Congress and Exposition. Of particular interest are the 30 industrial sections, including such fields as cement, chemical, construction, mining, petroleum, steel, public utilities and others, where representatives from these various industries will discover how other industries have reduced accident costs by new safety methods.

The metals section alone includes more than 22 talks and discussions on safety problems and solutions in steel mills and fabricating plants. Tom M. Girdler, president, American Iron and Steel Institute, and chairman, Republic Steel Corp., will speak at the metals section luncheon, Oct. 11, on "Accomplishments of the Steel Industry for the Safety of Employees."

Superior Steel Corp. Seeks Approval of Loan

PITTSBURGH. — Stockholders of the Superior Steel Corp. on Oct. 10 will be asked to approve an increase in bonded debt to $2,000,000. It is probable a new issue will be sold and proceeds used to retire $963,000 of bonds now outstanding and $500,000 in notes. The remainder will be for additional working capital.

...OBITUARY...

MICHAEL B. KELLY, founder and president of the American Steel Co., Pittsburgh, died in Pittsburgh Sept. 13. This company was organized by Mr. Kelly in 1902.

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FRANK H. SLOAN, foundry superintendent for Union Metal Mfg. Co., Canton, Ohio, died of a heart attack Sept. 6 in Baltimore.

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THOMAS MACBETH, president Bruce-Macbeth Engine Co., Cleveland, died Sept. 11 aged 81 years. Born in Berea, Ohio, in 1857, Mr. Macbeth joined his father's foundry, the Macbeth Iron Co., which he later headed. In 1909, when the company was consolidated with the Bruce-Merriam-Abbott Co. to form the Bruce-Macbeth Engine Co., manufacturer of gas engines, Mr. Macbeth became president.

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CARL L. PFEIFER, treasurer of the Chain Belt Co., Milwaukee, died suddenly in Philadelphia on a business trip on Aug. 24, aged 58 years. He had been identified with the company since 1914.

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EDWIN HENRY MARTIN, formerly identified with the Buffalo Bolt Co., Buffalo, before his retirement about eight years ago, died at his home in that city on July 30, aged 74 years. He was one of the first graduates of the Case School of Applied Science in 1892 and soon thereafter became superintendent of the Lukens Steel Co. He later built the Diamond State Steel mill in Wilmington, Del., and in 1901 was appointed metallurgical engineer for the Carnegie Steel Co., Pittsburgh. Three years later he resigned to become superintendent of Lalance & Grosjean Mfg. Co., and in 1908 became identified with the Upson Bolt Co., Cleveland.

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ROBERT B. BEALE, manager of the turbine division, central station department, General Electric Co., Schenectady, N. Y., died of a heart ailment on Sept. 11 after a brief illness, aged 60 years. He had been identified with the company since 1899.

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CHARLES H. SCHEERBAUM, purchasing agent of the Abrasive Co., division of Simonds Saw & Steel Co., Philadelphia, died on Sept. 8.

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FRANK A. SCHNITZER, engineer for the Baker-Raulang Co., Cleveland, industrial truck manufacturer, died Sept. 11 at his home in Cleveland at the age of 69.

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EDWARD J. WHITAKER, former superintendent of the Brown Hoisting Machine Co., Cleveland, and later, until he retired a year ago, a sales engineer for the American Crucible Products Co. at Lorain, Ohio, died Sept. 13 in Cleveland.

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WILLIAM A. SCHENDEL, founder and president of the Atlas Metal Parts Co., Milwaukee, and from 1908 to 1936 purchasing agent of the A. O. Smith Corp., Milwaukee, died from a heart attack on Sept. 16, aged 53 years. He organized the Atlas firm in 1918.

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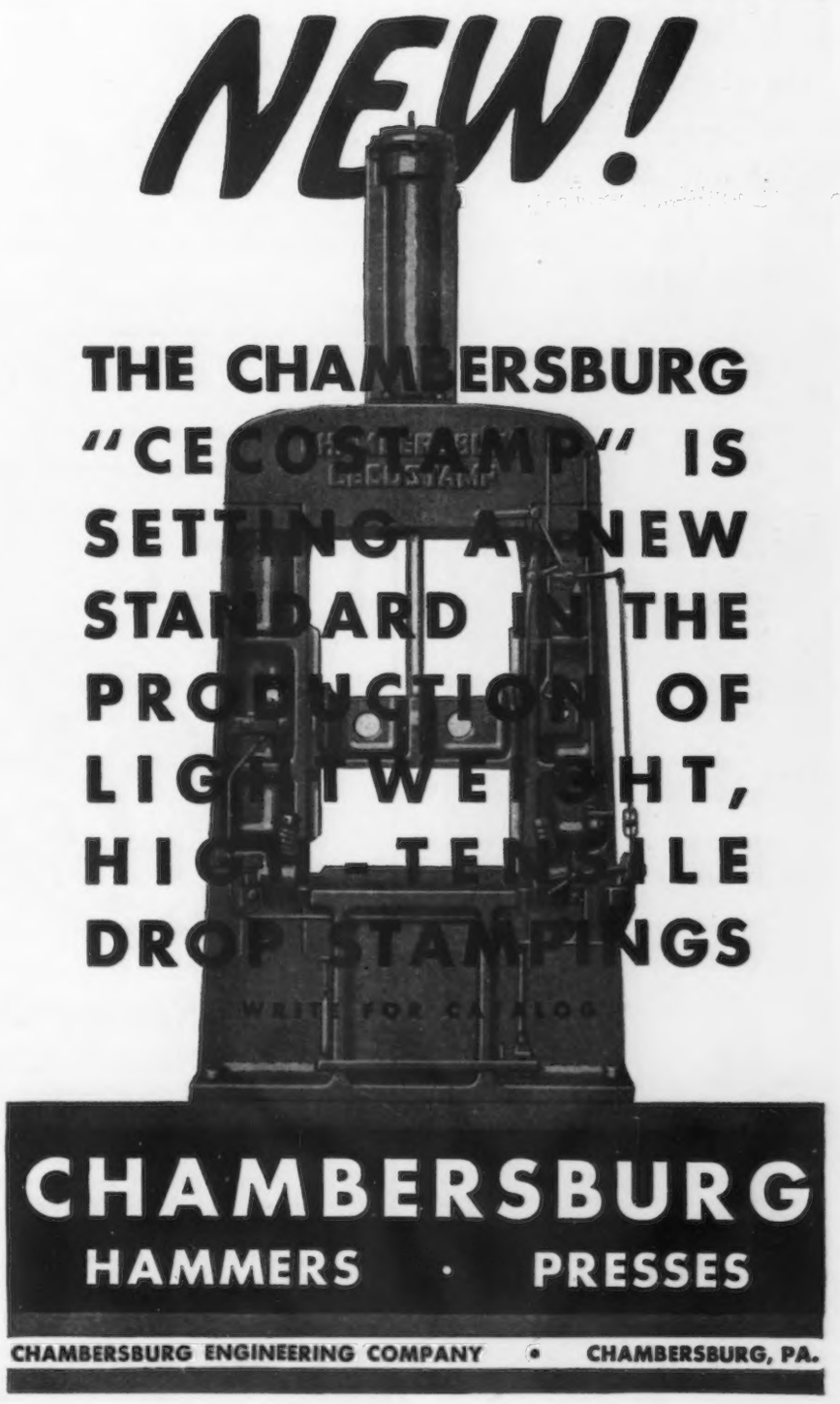
ALBERT E. BOULTON, mechanical engineer, formerly associated with Van Dorn Iron Works and Art Metal Construction Co., both of Cleveland, died Sept. 8 in Cleveland at the age of 49.



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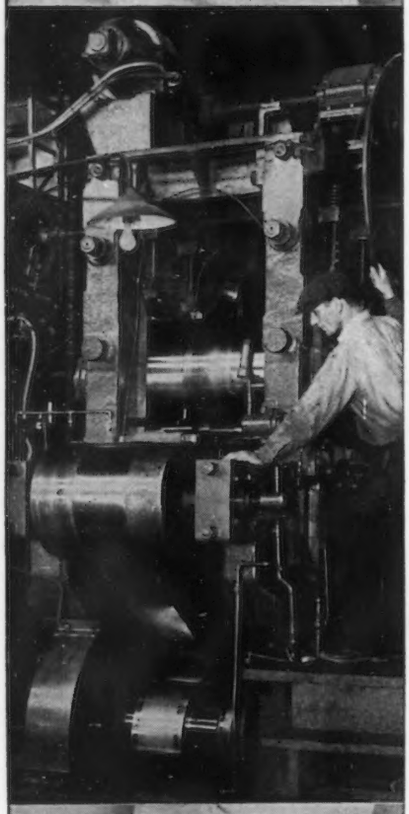

Barium STAINLESS STEEL CORP.
CANTON, OHIO.

Steel Cartel to Hold Prices Despite Alleged "Dumping"

LONDON (*By Mail*).—Meeting in London recently, the Commission of Comptoirs of the International Steel Cartel decided to make no alteration in export prices for any markets. This refers to all steel products.

There was also a meeting of the Joint Coordinating Committee of the Cartel, which reviewed the export situation and a number of routine matters. No public statement was issued.

The Commission of Comptoirs is a body representing the various sales comptoirs which organize the exportation of steel products in accordance with the conditions prescribed by the main cartel agreement. There are comptoirs, for example, which deal with semi-finished steel, plates and joists.

Special interest attaches to the commission's decision in view of the pressure which interested parties have recently brought to bear on its members to reduce quotations. It is understood that the decision was reached after full consideration had been given to the present position in regard to United States exports, including shipments by independent producers. In London the view is now held that these outsiders who, unlike the leading American exporters, have no "gentlemen's agreement" with the Cartel on export prices, have subsided in a number of markets.

At present they appear to be concentrating their efforts on the South African market and, as a result, the South African Board of Trade and Industries has made a strong recommendation that dumping duties should be imposed on many iron and steel products from the United States. This recommendation is the result of representations from the South African iron and steel industry, which asks for protection against price cutting by American outsiders. The South African industry maintained that iron and steel products were being exported to the Union at prices far below the fair average of prices ruling in the world markets and materially lower than the current domestic values in America. The South African industry has cut its prices in an effort to meet the competition, but without avail.

The board, after investigating these

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complaints, found that a perusal of the domestic values in the United States strongly suggested that ordinary dumping was taking place and that the American independents were slashing prices, so much so that the parties to the International Cartel agreement had decided to quote competitive prices in the Far East to meet them. It found in some cases that dumping was taking place to the extent of 50 to 83 per cent. The commodities in which the board has recommended the Government to levy dumping duties include reinforcing rods, steel plates, and galvanized and corrugated sheets.

British Auto Manufacturer Asks Lower Steel Prices

LONDON (*By Mail*).—W. E. Rootes, head of the Humber-Hillman-Commer automobile combine, has made an appeal to the leaders of the British iron and steel industry to recognize that a monopoly and the formation of price rings carry grave responsibilities. He asked them to give a new impetus to the industrial development of the country by reducing prices.

British Steel Men Abandon U. S. Visit

WAR fears in Europe this week have canceled a visit to United States steel plants of more than 300 British steel men and their wives.

Many members of the Iron and Steel Institute and Institute of Metals of Great Britain had planned to come to the United States in October on invitation of the American Iron and Steel Institute and the American Institute of Mining and Metallurgical Engineers. Walter Tower, executive secretary of the American Iron and Steel Institute, notified that organization's members that the proposed visit had been dropped "owing to the international situation."

All arrangements that had been made for the proposed meeting and banquet in New York, as well as for the proposed visits to various steel centers and other points of interest, are being canceled, Mr. Tower said.

Automatic Wire Goods Mfg. Co., 54 Bleeker Street, New York, will move to larger quarters at 65 Bleeker Street. Paul Spiegel is head.

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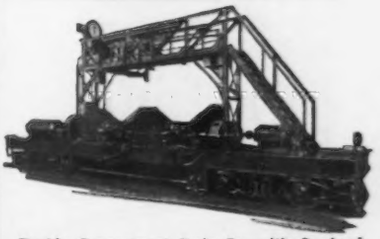

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Special Cars and Electrically Operated Cars for every conceivable purpose.

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Engineers - Manufacturers

1140 Ivanhoe Rd., Cleveland, O.

Gisholt Host to Employees And Their Families

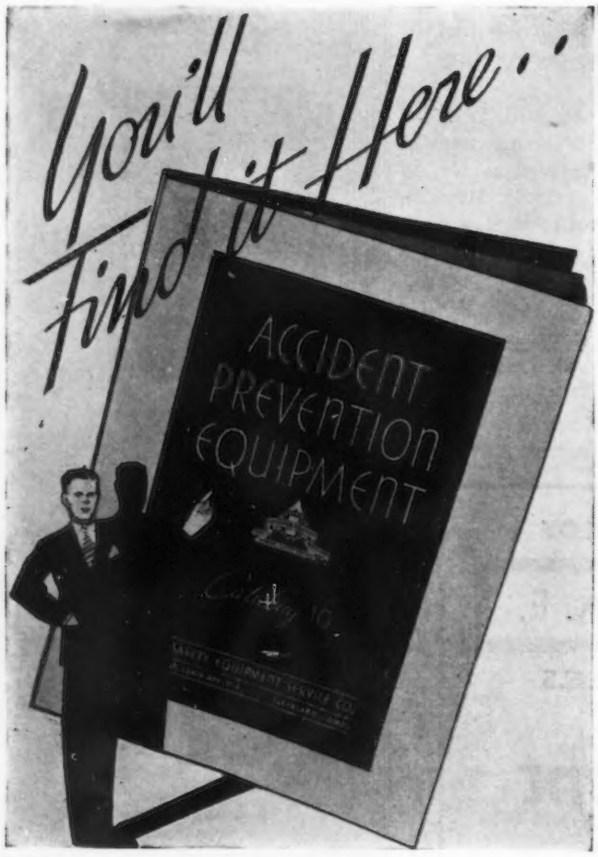
THE Gisholt Machine Co., Madison, Wis., was host recently to its employees and their families. Numbering more than 2000, the company's guests toured the plant from foundry to erecting and testing departments, covering more than a mile in their tour that ended in a luncheon lawn party. Employees and their families were thus able to better acquaint themselves with the various activities of the company, which plans later to similarly open its plant to the entire community.

Tour of the plant began at the office of the president, Hobart S. Johnson, son of the founder of the company, who with his two sons, George H. Johnson, vice-president and H. S. Johnson, Jr., assistant secretary, greeted all guests, among whom were several co-workers of President H. S. Johnson in the Gisholt shops some 45 years ago. These included A. G. Hansen and A. C. Anderson, both of whom have sons now working in the plant.

In addition to the latest of Gisholt lathes, finished and in process, a point of interest was the progenitor of all the current designs, namely the first Gisholt lathe ever built, now prominently displayed in a corner of the assembly department.

From a small frame structure with 78 employees, the plant has grown to take in more than 30 acres, with about 15 acres under roof. Approximately 700 are normally employed. How the company came to be named Gisholt was interestingly explained during the family party by George H. Johnson, grandson of the founder. In 1888, when the company was established, John A. Johnson, the founder, was associated with another Madison manufacturing company, namely, Fuller & Johnson. In view of this he was reluctant to use the name of Johnson in his new enterprise. Having a sentimental attachment for his home district in Norway, which he left at the age of 14, he chose the name of his native district, Gisholt, which in Norwegian means sunny wood.

Other executives at the open house included C. H. Johnson vice-president; C. L. McMullen, vice-president; G. E. Gernon, secretary; A. B. Morey, treasurer; and W. J. Hannum, sales manager, who flew from Buffalo, N Y., to be present.



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You cannot afford to be without our Complete Catalog No. 10, because it contains, in addition to illustrations and descriptions of a very general line of Safety Equipment, ideas on what to use and how to use equipment that will prevent accidents, eliminate injury to workmen, and cut high compensation costs and medical fees. Every Safety Engineer, Purchasing Agent, General Manager and, in fact every one who is interested in preventing accidents, should have a copy for their personal use. If you do not already have this valuable book, write for your copy today, and it will be sent to you by return mail.

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Buell W. Nutt, President—1228 St. Clair Ave., Cleveland, O.

Manufacturers of a General Line of Accident Prevention Equipment

Veteran Employees at Gary Plant Honored

THREE hundred and twenty-seven veteran employees of the Gary steel works of Carnegie-Illinois Steel Corp. are being awarded service medals in recognition of 25 years or more of continuous service. Approximately 50 medals are presented each day at a series of luncheons at the plant lunch club. The luncheons began Sept. 8 and continued until Sept. 16.

Three women are included in these ceremonies, two receiving 25-year medals and one being awarded a 30-year medal. At the conclusion of these presentations on Friday, 208 employees will have received 25-year medals, 88, 30-year medals; 22, 35-year medals, five 40-year medals and four 45-year medals. A brief address by E. E. Moore, general superintendent of Gary works, preceded each presentation ceremony.

Utilizing Waste Pickling Acid

(CONCLUDED FROM PAGE 45)

desirable, it is treated with silicate of soda which reacts chemically to form ferric silicate and at the same time seals the pores.

In addition to its uses as wall board, pipe covering, building block, and for modifying clay products, Ferron has chemical uses, removing hydrogen sulphide and other sulphur from gases and liquids.

In the Sharon plant, chemical storage, mixing tanks, filter presses and lime storage will be located on the second floor, with precipitating tanks, pug mill and dryer installed on the first floor.

It is estimated that a steel company dumping about 10,000 gallons of waste pickle liquor daily, could produce instead about 25 tons of this insulating and building material.

The costly disposal problem has long been a headache to operating departments of mills. At one plant it is estimated that rearrangement of sewer lines in order to concentrate all acid wastes at one point for treatment would cost around $40,000.

At some points the mills and plants have had little or no trouble, usually due to the presence of a large stream or body of water in which the acid effluents are so diluted as to cause little or no trouble. However, in other districts the banks of many "industrial streams" are practically lined with industries using the water for cooling and other purposes, and the volume of water is entirely inadequate to serve all the users safely and efficiently.

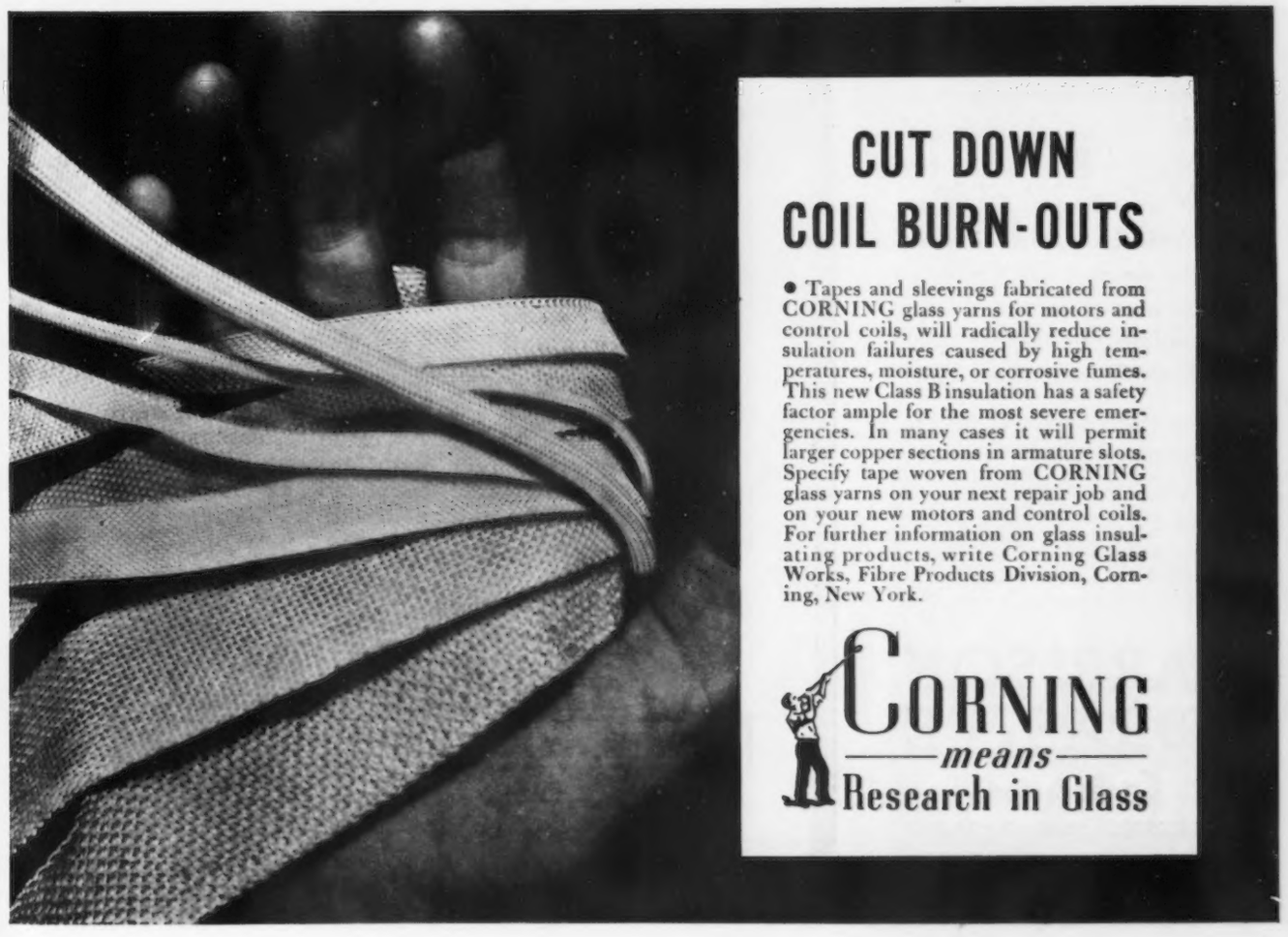
Colorado Fuel Has Loss On 38% Output

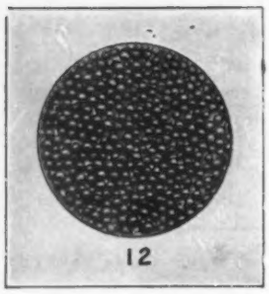
COLORADO FUEL & IRON CO., Denver, reports for the first six months of 1938 a net loss of $829,362 after all charges, taxes and reserves. In the preceding 12 months the company had a net income of $1,207,849, or $2.18 a common share. The company's rate of ingot production for the first half of this year averaged 38.3 per cent, compared with 69.6 per cent in the preceding year.

CIO Sole Bargainer At Hudson's Plant

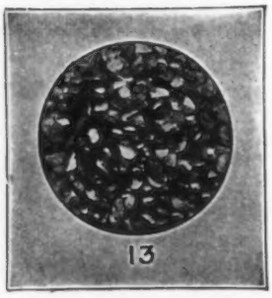
WASHINGTON. — The NLRB has recognized the CIO's United Automobile Workers Union at the Hudson Motor Car Co. in Detroit, and the AFL's International Molders' Union at the Unit Cast Corp., Toledo, as the exclusive collective bargaining agencies for employees at these two plants.

In the Hudson Motor case, the board checked company payrolls against union membership petitions and announced its decision after company representatives, according to the NLRB, did not contest the authenticity of the union signatures. In the Unit Cast Corp., the board held a run-off election on Aug. 17.





SHOT



GRIT

Unusual quality is creating demands for both our Heat-Treated Chilled Shot, and Heat-Treated Steel Grit.

One contract calls for 300 tons of our steel grit; another contract calls for 250 tons of our Special Heat-Treated Shot. Many carload lots of both shot and grit.

There must be a reason for this, and the reason is plain: namely, unusual quality; prompt deliveries; uniform quality the year round; satisfactory prices.

Send samples of the sizes you are now using. We will match any size, and name prices that will interest you.

We manufacture a shot and grit that you will eventually use.

HARRISON ABRASIVE
Corporation
MANCHESTER, NEW HAMPSHIRE

We Never Compromise With Quality

Coiled Silicon Strip Steel

(CONTINUED FROM PAGE 53)

elimination of two or three handling operations in the customer's plant.

Further labor saving is effected after the coils are mounted on the reels. Used with an automatic feed the coils require little or no attention on the part of the operator. Many plants employ only one punch press operator for two or more machines.

The third economy of coiled silicon strip over silicon sheets, increased die life, is the result of a number of important factors. One of these is the nature of the mill scale which, being lighter, is said to result in less abrasion and die wear. Another important factor is the elimination of half punches. As every experienced punch press operator knows a half punch causes almost as much wear on dies as a dozen full punches.

The three important economies of coiled silicon strip outlined here and its various other advantages over flat slit sheets, are best realized when the laminations can be punched on automatic stamping machines. The necessary auxiliary equipment consists simply of an automatic centering reel, an automatic roll feed, and a suitable oiling device. With this arrangement, increased speeds in the punching operation often may be realized.

Displacing the old method of using flat sheets slit to size and fed by hand, such set-ups, with their considerably decreased labor costs and lower percentage of scrap are in numerous instances bringing electrical manufacturers very important savings.

Dravo Gets Ethyl-Dow Chemical Barge Order

PITTSBURGH. — Dravo Corp., Pittsburgh, has received an order from the Ethyl-Dow Chemical Co., Wilmington, N. C., for a welded standard 100 ft. x 26 ft. x 6 ft. 6 in. flush deck type steel barge to be fabricated at the Dravo Neville Island shops, and assembled at the Dravo ship yard on the Christiana River at Wilmington, Del.

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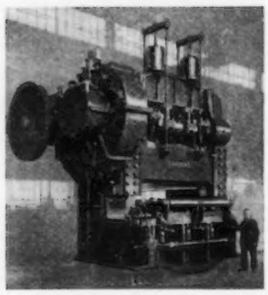

Thomas Shears are designed to meet the most exacting shearing requirements. They embody the most advanced improvements . . . features that lower upkeep to a minimum and give the greatest possible production and economy! Feeding tables and gauges can be designed and adapted to your specifications.

Let us quote on your requirements

THOMAS
MACHINE MANUFACTURING COMPANY

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PITTSBURGH, PA.

FABRICATING MACHINERY

3 Companies Get Orders For Gun Barrel Forgings

WASHINGTON.—The Navy Department has awarded contracts totaling $443,773.06 for gun barrel forgings to the following companies: Bethlehem Steel Co., Bethlehem, Pa., $163,629.75; The Midvale Co., Nicetown, Philadelphia, $161,794.65; and National Forge & Ordnance Co., Irvine, Warren County, Pa., $118,348.66.

The Navy has extended from Oct. 5 to Oct. 19 the deadline date for opening bids on the construction of three 35,000-ton battleships. The vessels, bids on which were invited on July 14, will require about 11,000 tons of plain steel and 14,000 tons of armor plate each.

Crosley Denies His Company Will Enter Automobile Field

CINCINNATI.—Rumors that Crosley Radio Corp. will enter the automobile field were denied here by Powell Crosley, Jr., who said he is experimenting with small cars only as a hobby. A recent call for stockholders to eliminate the word "radio" from the company's name is due to a desire to permit wider latitude for the company's business in which the refrigerator already provides a larger share than the radio, Mr. Crosley said.

Australia's Imports of Steel Climb Sharply

WASHINGTON.—The value of imports of iron and steel products into Australia for the year ended June 30, 1938, amounted to £6,114,488, an increase of £2,770,498 over receipts during the same period of 1937, the Commerce Department reports.

Imports of tin plate for the 1937-38 period registered an increase of £1,094,000 over the value of imports in 1936-37. Imports of "plain" plate and sheets increased £796,000, while receipts of bars, rods, hoops, and ingots also increased appreciably in value, the report aid.

Todd-Donigan Iron Co., Louisville, Ky., has been appointed a distributer of Toncan iron sheets, according to an announcement by N. J. Clarke, vice-president in charge of sales for Republic Steel Corp., Cleveland.

but also clips, clamps, bent wire shapes, small stampings, and the like are produced in large volume by this company for manufacturers all over the United States. On these items, too, Gibson keeps close check on materials and specifications. Due to special equipment available in this large, modern plant, prices are very much "in line" and deliveries rapid. Try us for such parts!

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. . . THE NEWS IN BRIEF . . .

Members of the Associated Machine Tool Dealers of America for the first time in 15 years will hold their annual convention, Oct. 10-11, at Cincinnati.—**Page 63.**

Defeat of President's purge leads business to hope for more independent Congress; trade psychology already benefits.—Page 66.

Contract for $332,100 of projectiles for the Navy Department is in a list of awards reported this week by the Public Contracts Board. Supreme Court justices will find many AFL-CIO disputes up for settlement when they sit for the fall term in October.—**Page 68.**

FTC charges the Florida Building Materials Institute, Inc., with unlawful practices in restraint of trade, elimination of competition and other monopolistic acts.—**Page 70.**

Czechoslovakia reports a slight increase in pig iron production while steel ingot output drops.—**Page 70.**

NLRB orders another election for Utah Copper Co. and Kennecott Copper Corp. employees following voting in which the CIO union did not receive a majority.—**Page 71.**

ICC receives protests on rail tariffs on iron and steel shipments from Chicago and Duluth to a Minnesota destination.—**Page 71.**

Steel marketing process in a revolution, scrap leader says.—**Page 71.**

Stockholders of Superior Steel Co. on Oct. 10 will be asked to approve an increase in bonded debt to $2,000,000.—**Page 76.**

Ten thousand people are expected to attend the National Safety Council's Silver Jubilee, Oct. 10-14 at Chicago. The Council's metal section will hear an address by Tom M. Girdler.—**Page 76.**

Steel cartel to hold despite alleged "dumping."—**Page 78.**

British auto manufacturer asks lower steel prices.—**Page 79.**

British steel men, fearful of a general European war, have dropped their plans to visit United States steel plants in October.—**Page 79.**

Twenty-five years' service wins medals for 327 employees at Carnegie-Illinois Steel Corp.'s Gary, Ind., steel works.—**Page 80.**

Gisholt host to employees and their families.—**Page 80.**

Labor Board certifies the CIO's United Automobile Workers Union as exclusive bargaining agencies for employees of Hudson Motor Co. and Unit Cast Corp.—**Page 81.**

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CONVENTIONS

Sept. 21 to 23—National Industrial Advertisers Association, Cleveland.

Sept. 26 to 30—Association of Iron and Steel Engineers, Cleveland.

Oct. 5 to 7—American Society of Mechanical Engineers, Providence.

Oct. 10 to 14—American Institute of Steel Construction, French Lick Springs, Ind.

Oct. 12 to 14—Porcelain Enamel Institute, University of Illinois, Urbana, Ill.

Oct. 12 to 15—The Electrochemical Society, Rochester, N. Y.

Oct. 13 to 15—Society of Automotive Engineers, aircraft production meeting, Los Angeles.

Oct. 14 to 15—American Society of Tool Engineers, Pittsburgh.

Oct. 17 to 20—American Institute of mining and Metallurgical Engineers, Detroit.

Oct. 17 to 21—National Metals Congress, Detroit.

Oct. 21 to 22—Industrial Unit Heat Association, French Lick, Ind.

Colorado Fuel & Iron Co. reports for the first six months of this year a net loss of $829,362 after all charges on operations averaging 38.3 per cent.—**Page 81.**

Dravo gets Ethyl-Dow chemical barge order.—**Page 82.**

Navy Department awards contracts totaling $443,773 for gun barrel forgings to three eastern companies, extends deadline on bids for three battleships to Oct. 19.—**Page 83.**

Crosley Radio Corp. does not plan to enter the automobile field reports Powell Crosley, Jr. Experimenting with small cars is merely a hobby, Mr. Crosley said. Meanwhile the Crosley company plans to drop the word "radio" out of its name.—**Page 83.**

Australia's iron and steel imports in first six months of 1938 totaled approximately $13,000,000 more than in the like 1937 period.—**Page 83.**

Campaign to alter the neutrality laws and Johnson Act, thus permitting shipments of U. S. munitions to warring countries, is forecast at Washington.—**Page 106.**

Stainless steel expansion joints are being used to safeguard expansion and contraction of cement sections in the Grand Coulee Dam.—**Page 89.**

Contracts for two phenolate plants to be erected at Marcus Hook, Pa. and Toledo, Ohio, have been awarded Koppers Co. by Sun Oil Co.—**Page 89.**

Dutch East Indies provides a good market for American machinery, tractors, automobile accessories and air conditioning equipment, according to Government reports to the Illinois Manufacturers Association.—**Page 89.**

John L. Perry, Carnegie-Illinois Steel Corp. president, finds orders still increasing, says Irvin works may operate in short time.—**Page 89.**

Nineteen hundred and thirty-nine will be "satisfactory" to Vanadium-Alloys Steel Co. stockholders, Roy C. McKenna, president says.—**Page 89.**

Eight cities and 13 plants in the United States are to be inspected by a delegation from the Institute of Vitreous Enamellers, London, Eng.

FORGET THE NAME CHECK RESULTS!

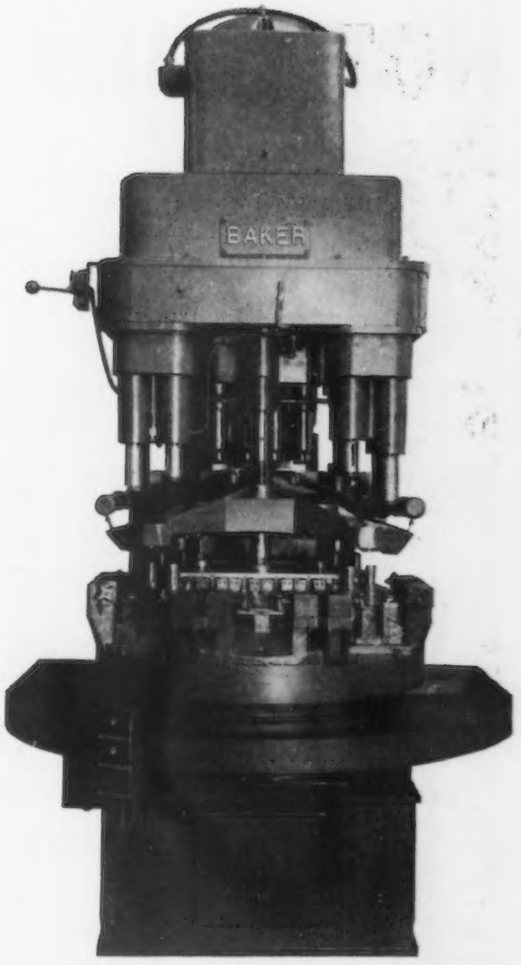
BAKER

Find out in your own plant which machines have consistently given the best drilling, boring and tapping performances. Which ones have turned out the fastest work with maintained accuracy and fewest required repairs? These machines probably carry the name—Baker.

In racehorses or machine tool construction, past performance records are important. The largest, most efficient production plants have checked Baker machines and are currently buying Baker equipment.

The 30 HO shown is one of the modern "Clean Line." This type in single and multiple spindle designs can be adapted to standard or special production.

Send a blueprint or sample part to our engineering department. We will recommend proper equipment and estimated cost figures to handle any boring, drilling, tapping or reaming operations. Baker Brothers, Inc., Toledo, Ohio. New Jersey office 1060 Broad St., Newark.



No. 30-Ho machine with 24 spindle head and 4 station power indexing table with 4 holding fixtures. Each holding 4 parts upper control arm. Operation: drill, spotface and chamfer, and ream two holes in each part.

★BAKER★

Lincoln Arc Welding Foundation Distributes $200,000 in Prizes

AFTER judging thousands of papers submitted in the $200,000 award program established by the James F. Lincoln Arc Welding Foundation, Cleveland, early in 1937, the jury has announced 382 awards, ranging from $101.75 for honorable mention to $13,941.33, the grand award. The latter went to Mr. and Mrs. A. E. Gibson, president and stockholder, respectively, the Wellman Engineering Co., Cleveland, whose treatise on the "Commercial Weldery" covers all elements required to assure the business and technical success of users of welding throughout industry.

Anant H. Pandya and R. J. Fowler, engineers, Diagrid Structures, Ltd., London, England, were awarded $11,397.06 for their paper on "The All Welded Grid Applied to Plane and Spatial Structures," which, it is thought, will usher in a new era in the design and framing for roofs and floors of buildings.

Robert E. Kinkead, consulting engineer, welding, Carnegie-Illinois Steel Co., Cleveland, received the next highest award, $8,852.94, for his paper on "Industrial Machinery, Steel Making," which describes the use of carbon arc welding in producing clad metals.

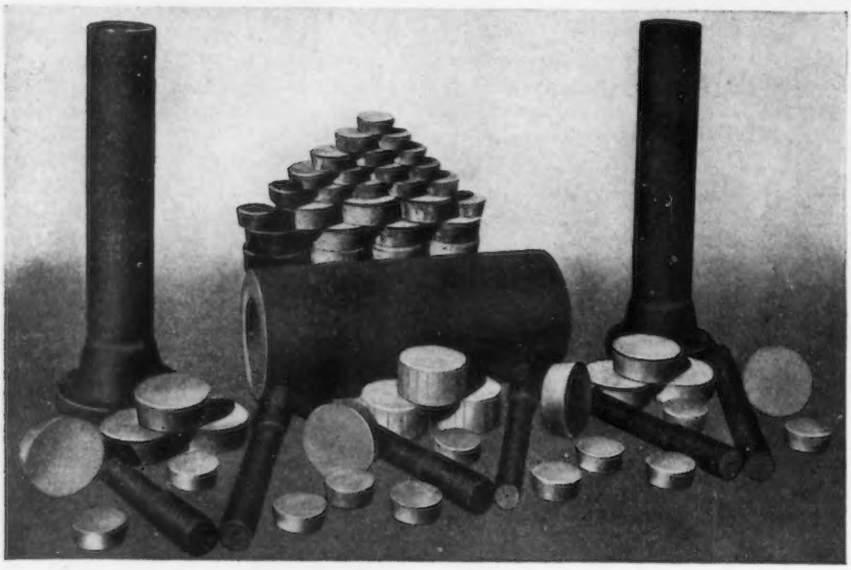
MR. AND MRS. A. E. GIBSON, president and stockholder, respectively, Wellman Engineering Co., Cleveland, win Grand Award ($13,941). Jas. F. Lincoln Arc Welding Foundation.

Award of $7,326.46 went to L. J. Carey and Marvin Whitlock, foreman and engineer, respectively, American Air Lines, Inc., Chicago, for their paper on "Weld-Aircraft Piping," a study showing a stride forward in an industry not as familiar with arc welding as with other forms.

The other 378 awards were spread over the 11 classification of the award program. Recipients and amounts of main awards in the various classifications are in part as follows:

Automotive, engines, bodies, frames and trailers, totaling $14,957.93. Awards: First, H. C. Wendt, chief engineer, Hackney Brothers Body Co., Wilson, N. C., $3,764.94, for his paper on "Welded

FCC
HOT WORK STEELS



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School Bus Body"; second, Fred S. Beach, Sr., designing engineer, Northwestern Electric Co., Portland, Ore., $2,543.88; third, C. A. Davis, Jr., engineer, Caterpillar Tractor Co., East Peoria, Ill., $1,729.84; and fourth, Nelson Severinghaus, superintendent, Consolidated Quarries Co., Lithonia, Ga., $1,526.33.

Aircraft, 10 awards, totaling $13,787.90. Recipients include: L. J. Carey and Marvin Whitlock, $7,326.46, as noted above; R. H. Upson, consulting engineer, Kay Products Co., Detroit, $1,322.82, for his paper on "Arc Welding Aircraft"; James W. Fitch and John Czarniecki, engineers, Kenworth Motor Truck Corp., Seattle, $1,017.56, for their paper on "Beaching Gears for Aircraft."

ROBERT E. KINKEAD, consulting engineer, welding, Carnegie - Illinois Steel Corp., Cleveland, wins $8,852.94. Jas. F. Lincoln Arc Welding Foundation.

Railroad—locomotive, freight and passenger cars, and locomotive and car parts, 17 awards, totaling $13,736.90. Recipients include: John H. Hruska, metallurgist, Electro-Motive Corp., La Grange, Ill., $2,543.88 for his paper on "Welded Body of Diesel Locomotives"; C. B. Faverty, chief engineer, Ryan Car Co., Chicago, $1,526.33; and R. H. Redline, welding supervisor, American Locomotive Co., Dunkirk, N. Y., $1,322.82.

Watercraft, 25 awards, totaling $12,210.53. Recipients include: J. T. Dalcher, consulting engineer, New York, $2,543.88, for "Modern Type Welded Deck Barge"; S. A. Midnight, structural designer, hull department, American Shipbuilding Co., Cleveland, $1,322.82; and R. H. Macy, hull technical department, Newport News Shipbuilding & Dry Dock Co., Newport News, Va.

Structural—buildings, bridges, houses and miscellaneous structures, 71 awards, totaling $26,049.55. Recipients include: R. V. Proctor, general manager and chief engineer, Commercial Shearing & Stamping Co., Youngstown, Ohio, $2,747.39, for his paper on "Arc Welded Tunnel Liner"; Messrs. H. E. Boath and Charles MacNish, Engineers Corps, U. S. Army, St. Louis, co-authors, $1,526.33; and R. S. Treat and J. F. Willis, Connecticut State Highway Department, Hartford, Conn., Joint award, $1,526.33.

Furniture and Fixtures—house and office, 10 awards, totaling $10,684.28. Recipients include: E. J. Freeman, associate professor, Clemson College, S. C., $3,764.94, for "Welded Lecture Room Chair"; Paul J. Birkmeyer, New York, $2,543.88; Clinton Bolin, Lloyd Mfg. Co., Menominee, Mich., $1,729.84; and R. E. Drover, III, Austin Co., Chicago, $1,119.31.

Commercial Welding — job shops and garages, 20 awards totaling $11,549.14. Recipients include: H. E. McCord and F. H. Drewes, W. G. Jarrell Mfg. Co., Charlotte, N. C., $3,764.94 jointly, for

paper on "Organizing and Operating a Commercial Welding Shop"; J. M. Pool, Louisville Welding Works, Louisville, Ky., $2,543.88; E. W. Weinberger, owner, Weinberger Garage, Mott, N. D., $1,526.33; and G. P. Harber, owner, Harber Engineering Works Albany, Ore., $1,322.82.

Containers—stationary (tanks, etc.) and moving (pipe lines, etc.), 30 awards, totaling $12,719.28. Recipients include: A. A. Seipel, hydraulic and mechanical engineer, Bureau of Reclamation, Denver, $3,764.94, for paper on "Welded Scroll Cases for Hydraulic Turbines"; G. M. Stearns, district production engineer, Cities Service Oil Co., Russell, Kan., $2,543.88; and T. S. Gaylord, supervisor of welding, Eastman Kodak Co., Rochester, N. Y.

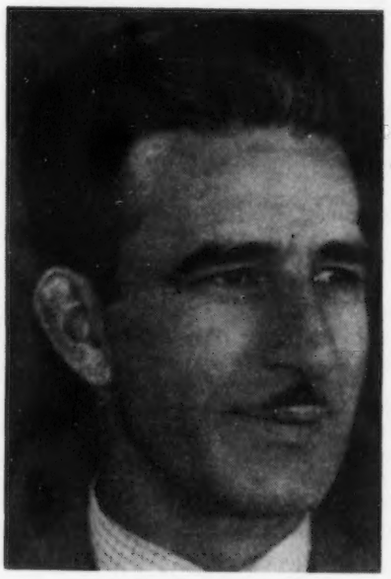
Welderies, 24 awards, totaling $22,081.67. Recipients in addition to Mr. and Mrs. Gibson, who received the grand award, include: P. H. Setzler, production manager, Lukenweld, Inc., Coatesville, Pa., $1,526.33; and A. H. Davision, engineer, U. S. Engineers, Providence, R. I., $1,322.82.

Functional Machinery—open to design studies of arc welding applied to machinery used in several industries, accounted for $28,592.83 of awards spread over the 10 divisions of the class—metal cutting, metal forming, electrical, prime movers, conveying, pumping and compressing, business, machinery not otherwise classified, jigs and fixtures, and machine parts. Recipients in this classification include: John Mikulak, mechanical engineer, Electric Machinery Mfg. Co., Minneapolis, $3,764.94, for paper on "Design for Vertical Synchronous Motor"; L. M. Davis and J. M. Mousson, Baltimore, $1,526.33, jointly; and J. N. Anderson, designing engineer, Otis Elevator Co., New York, $1,526.33.

MARVIN WHITLOCK, Eng., American Air Lines, Inc., Chicago, wins $7,326 jointly with L. J. Carey. Jas. F. Lincoln Arc Welding Foundation.

Eighty-three additional awards were made in this classification.

Industry Machinery.—In addition to Robert E. Kinkead, who received the third grand award as noted above, award recipients in this classification include: J. O. Bishop, master mechanic and welding supervisor, National Supply Co.,



L. J. CAREY, foreman, American Air Lines, Inc., Chicago, wins $7,326 jointly with Marvin Whitlock, engineer, American Air Lines. Jas. F. Lincoln Arc Welding Foundation.

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Torrance, Cal., $2,747.39; E. G. Grant, California Institute of Technology, $1,526.33; and R. F. Berman, Rayon Machinery Corp., Cleveland, and A. F. McDonald, American Bridge Co., Pittsburgh, $1,526.33 jointly as co-authors. The industry machinery classification, open to design studies in arc welding applied to machines used exclusively in one of the industries covered by this class, accounted for the largest number of awards, namely, 79, and the largest amount, $33,629.99.

The foundation's award program, which began 18 months ago, was judged by 31 engineering authorities from leading universities and colleges throughout the United States. At the conclusion of its judging of the papers, the jury of award issued a statement which said in part: "The savings to industry by arc welding claimed by the authors of papers aggregates $1,600,000,000. This figure is arrived at after discounting some very enthusiastic claims. Undoubtedly it would have been much greater had all the authors estimated gross savings from the application of arc welding to their products."

Vanadium-Alloys Head Sees Good Years Coming

PITTSBURGH.—A moderate increase in general business this fall is expected by Vanadium-Alloys Steel Co., Pittsburgh, which recently reported a net profit of $213,128 for the fiscal year ended June 30, equal to $1.06 a share on capital stock. This compares with $968,693 or $4.80 a share in the preceding year. According to Roy C. McKenna, president, the company does not predict normal or average earnings before the spring of 1939, but does believe that the calendar years 1939 and 1940 will be satisfactory to stockholders.

Grand Coulee Expansion Joints of Stainless

IN the Grand Coulee Dam construction, stainless steel vertical expansion joints are used to safeguard the expansion and contraction of the huge cement sections. Each section is 65 ft. long and is joined to the next section by a 1-in. joint filled with corkboard. Near the water face and below high tail water, a stainless steel seal is placed on each side of a diamond shaped asphalt seal formed in the concrete. These metal seals are shaped to allow for movement during the expansion and contraction of the building.

Koppers Gets Order For Phenolate Plants

CONTRACTS for two Koppers phenolate plants for the purification of refinery still gas have been awarded by Sun Oil Co. to the engineering and construction division of Koppers Co., Pittsburgh. A plant employing a two-stage system and with a capacity of 10,000,000 cu. ft. of gas a day is to be erected at the oil company's Toledo refinery. A single-stage plant, to be provided for the Marcus Hook, Pa., refinery, will have a daily capacity of 12,000,000 cu. ft. of gas.

Outlet For U. S. Machinery Seen In Dutch East Indies

A GOOD market for metal-working machinery, machine tools, electrical machinery, tractors for use on large estates, automobile accessories and automobiles exists in the Dutch East Indies for American manufacturers, according to a report to the foreign trade committee of the Illinois Manufacturers' Association by the United States Trade Commissioner from those islands.

Air conditioning equipment can readily be marketed in tropical Java and other sections but the machinery must be dependable and foolproof, as the atmosphere contains a great amount of humidity, the report stated.

PAGE
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PAGE *Welding* WIRE

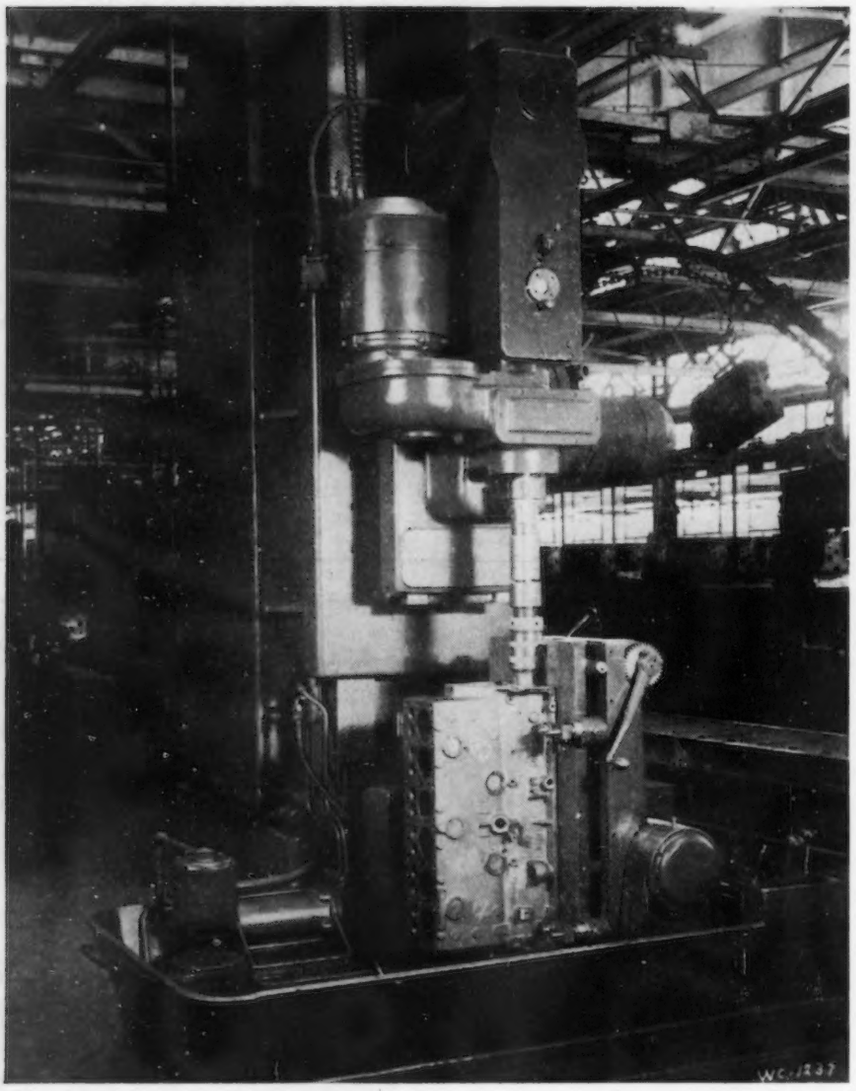


FIG. 26—One of the largest pieces of Superfinishing equipment used by Chrysler. Processing the holes in which crankshaft main bearings are carried helps to eliminate the "wear in" formerly required in autos.

The Development of Chrysler's Superfinish

(CONCLUDED FROM PAGE 61)

machine with standard SAE test cups, finished to different degrees of smoothness, provided the material. The surface of each cup was checked with the Profilometer before the test. Results showed that whereas a surface with 16 to 18 micro-inches average roughness would support loads of only 117 lb. before failure of the oil film, a surface which measured one to two micro-inches carried a load of 217 lb. without failure of the oil film (Fig. 25). Largely as a result of similar data, bearing manufacturers recently have increased the rated capacity of their product.

Mr. Wallace's explanation of this phenomenon is interesting because it is reversal of the conventional approach to the subject.

"The 'scrubbing' action of the stones provides a method of producing the *ultimate bearing* and practically eliminates the necessity for and uncertainty of producing 'worn in' or 'broken in' bearing surface after the parts are assembled and in operation," Mr. Wallace declares. "Base metal is bared by Superfinish. All the scratches which remain are *below* base metal. With Superfinish you establish the final bearing mechanically and all the scratches left in the surface are below the *man-made* bearing surface and possibly serve a good purpose as reservoir for oil. There are no outstanding points to rupture oil films and destroy contacting bearing surfaces."

Chrysler has introduced the practice of Superfinishing journals for supporting crankshaft main bearings, (Fig. 26) having demonstrated that much of the initial bearing wear is due to the fact that bearing liners fitted against rough surfaces loosen or wear by settling into the scratches on the rough surface. This has eliminated the former "wear in" of 0.0005 in. to 0.001 in. After pressure is applied on the bearing material such as babbitt, the imprint of the defective surface is plainly visible to the eye without magnification. Diagrams showing "wear in" of conventional bearings and Superfinished bearing surfaces are shown in Fig. 27.

Similarly, Superfinish improves piston wear and thereby greatly increases potential engine life. For instance a typical piston and cylinder with ordinary finish show a total wear of .0018 in. in the initial wearing period, distributed as follows:

Piston	.0013 in.
Cylinder diameter	.0005 in.
Total	.0018 in.

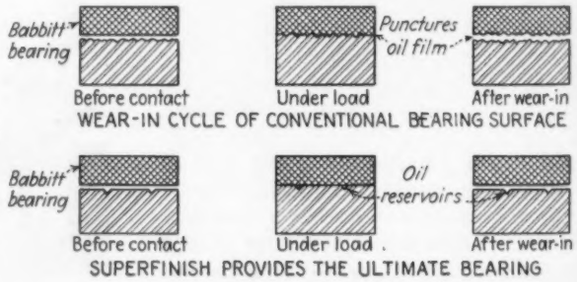
Experiments have shown that Superfinished surfaces on the piston and bore reduce wear to .0001 to .0002 in. in 10,000 miles operation, an improvement of something more than 9000 per cent.

Estimates based on Profilographs indicate that the actual initial area of piston contact is increased from about 5 per cent to about 80 per cent of the normal area by Superfinishing both piston and bore.

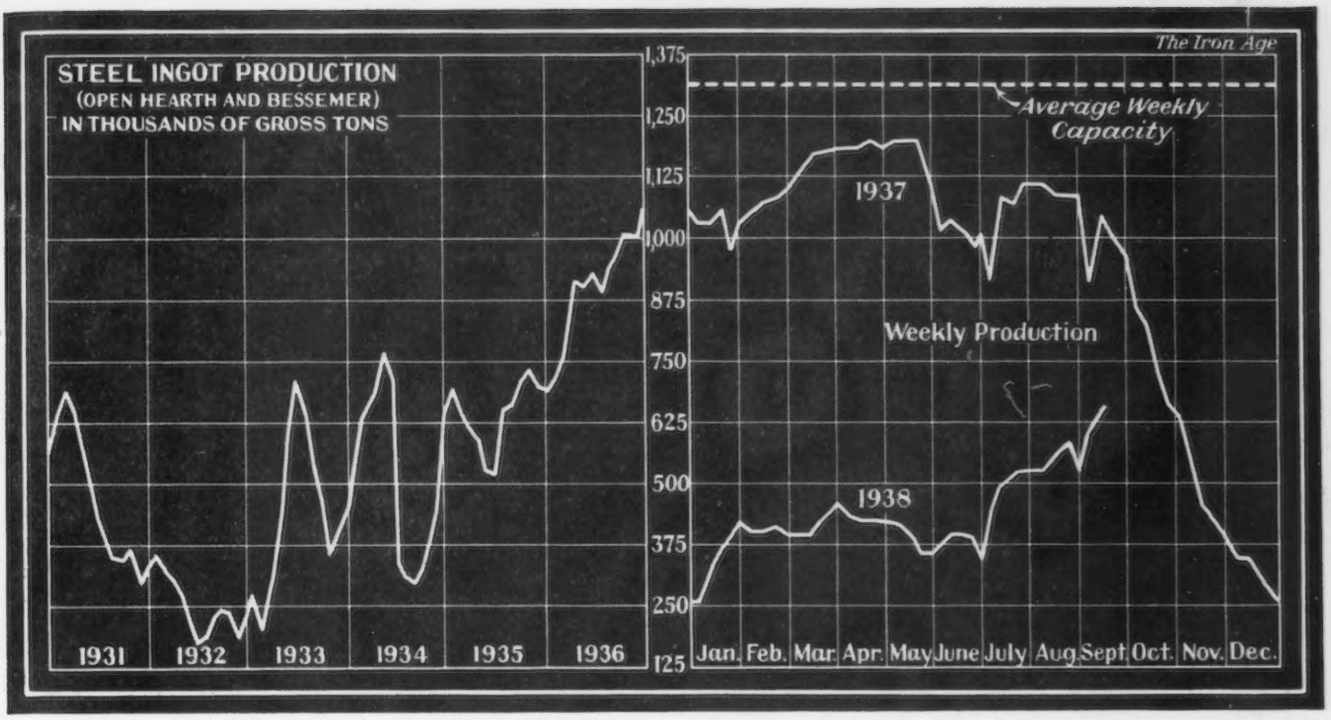
o o o

FIG. 27—It is considered that much of the initial "wear in" of bearings is mere settling into the rough scratches. Superfinish provides the ultimate bearing.

o o o

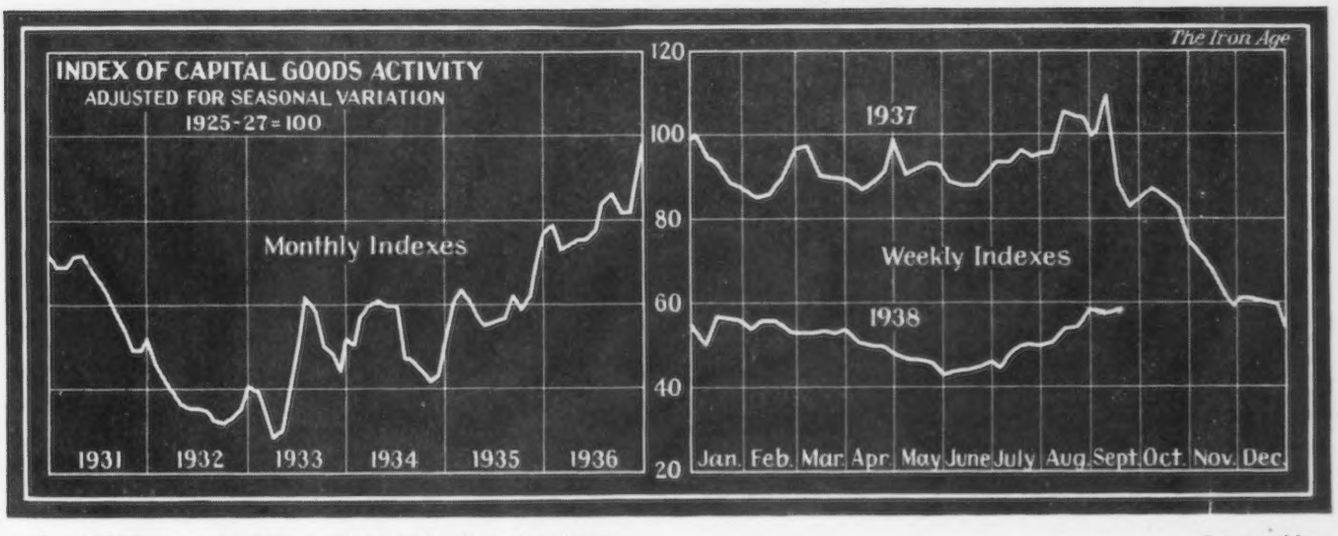


Steel Output Rises 2 Points to 47½ Per Cent of Capacity



District Ingot Production, Per Cent of Capacity	Pitts-burgh	Chicago	Valleys	Phila-delphia	Cleve-land	Wheel-ing	Buffalo	Detroit	Southern	S. Ohio River	Western	St. Louis	East-ern	Aggre-gate
CURRENT WEEK..	38.0	44.0	43.0	28.0	51.0	76.0	49.0	64.0	49.0	52.0	40.0	46.5	50.0	**47.5**
PREVIOUS WEEK..	35.0	42.0	42.0	28.0	49.0	67.0	49.0	52.0	49.0	48.5	40.0	44.0	50.0	**45.5**

Capital Goods Index Resumes Advance



AFTER experiencing a minor setback in the holiday week, THE IRON AGE index of capital goods acitivity has resumed the advance of the past 16 weeks, gaining 1.7 points in the week ended Sept. 17 to 58.6 per cent of the base years. This is 0.2 point above the pre-holiday week. As has been the case during most of the index's advance from the mid-summer low of 43, the heaviest contributers to the week's increase were the steel production and heavy construction series, both recording fairly heavy gains from the holiday lull. The week's only decline was shown in automobile series.

	Week Ended Sept. 17	Week Ended Sept. 10	Comparable Week 1937	Comparable Week 1929
Steel ingot production[1]	64.6	59.0	116.2	114.4
Automobile production[2]	48.0	48.9	94.6	113.1
Construction contracts[3]	71.0	68.1	63.3	103.5
Forest products carloadings[4]	53.9	53.7	68.1	111.9
Production and shipments, Pittsburgh District[5]	55.3	55.0	101.0	120.6
Combined index	**58.6**	**56.9**	**88.6**	**112.7**

Sources: 1. THE IRON AGE; 2. Ward's Automotive Reports; 3. *Engineering News-Record*; 4. Association of American Railroads; 5. University of Pittsburgh.

. . . .SUMMARY OF THE WEEK. . . .

. . . Rails and track accessories reduced; other prices reaffirmed.

o o o

. . . Tin plate price unchanged through the fourth quarter.

o o o

. . . Ingot output gains; new business trend slower; scrap weakens.

REAFFIRMATION of current prices on major steel products, excepting rails and track accessories, on which there were reductions, was generally expected. The announcement issued on Sept. 20 by the Carnegie-Illinois Steel Corp. will be followed by other producers. Prices of wire products and cold rolled strip have been continued through the coming quarter by the American Steel & Wire Co. Although no specific mention of tin plate was made in the Carnegie-Illinois statement, buyers have been informed that the present price of $5.35 per base box, Pittsburgh and Gary, will be unchanged. A reduction had been looked for, but the international crisis may have influenced the decision, as war in Europe would undoubtedly bring soaring tin prices.

Price reductions on railroad materials were $2.50 a gross ton on heavy rails to $40; tie plates, $3 to $43 a net ton; track bolts, $4 to $83 a net ton; splice bars, $2 to $54 a ton; cut spikes, $3 to $60 a ton; screw spikes, $5 to $91 a ton.

These lower prices may have been made as an inducement to railroad buying, without which there can be no approach to profitable operations by steel companies having large capacity in those products. While the reductions tend to restrict the possibilities for profit in steel making, this is more theoretical than actual, as there has been virtually no business in these lines for some months, and any tonnage received will aid in leveling out general overhead costs.

At the moment the only important railroad track material buying in sight is that recently announced by the New York Central, whose inquiries for 28,600 tons of rails and track accessories may be expected soon. While other roads may buy to take advantage of the lower prices, there are as yet no definite signs.

STEEL ingot production continues to gain, having risen two points this week to 47.5 per cent of the country's capacity, but the disappointingly slow improvement in new business during September tends to make the trade cautious in its expectations for the near future. Much depends on the automobile industry as to the extent of the further rise in operations over the next month or so.

Whether the crucial international situation has been a factor in a degree of hesitancy among buyers is not clearly indicated. The delay in the announcing of fourth quarter prices does not appear to have been an important influence because continuance of present prices on most products was a foregone conclusion. The European crisis has not had a marked effect on iron and steel exports, though shipments are hampered by advances in war risk insurance rates. Russia has bought a fairly large quantity of sheets here, and a sizable export order for wire has been received from another country, but generally export trade has not been stimulated by fear of inability to obtain European deliveries. Germany has bought 40,000 tons of steel scrap, which is an addition to a larger order placed in the United States a few months ago. Non-ferrous metals have been affected by the war scare, price advances having occurred in copper, lead and zinc, current quotations being the highest since mid-January.

After weeks of comparative inactivity, scrap markets have turned weaker at Chicago, Detroit and Cleveland, but the undertone at Pittsburgh is still strong. Steel-making grades have declined 50c. a ton at Chicago on mill purchases, bringing THE IRON AGE scrap composite price down 17c. a ton to $14.25.

THE IRON AGE finished steel composite price has declined to 2.286c. a lb. The only component of the index on which there has been a price reduction is heavy rails. Rivet prices have been reaffirmed for the fourth quarter.

TOPPING new business in the week was a 50,000-ton order for fabricated structural steel placed with the Bethlehem Steel Co. by the Metropolitan Life Insurance Co. for its housing project in the Bronx. This brought fabricated structural steel awards in the week up to 66,600 tons. An elevated highway in Queens takes 7000 tons. New projects out for bids total about 13,700 tons. Reinforcing bar lettings of about 18,000 tons were unusually large and included 5000 tons for the Red Hook housing project in Brooklyn and 3750 tons for the Hansen Dam near Los Angeles. Inquiries are out for 5300 tons for the Queens bridge housing project in Queens and 4700 tons for an aqueduct in the Colorado River project.

The Kansas Pipe Line & Gas Co., Norton, Kan., which is applying for a $20,000,000 RFC loan, contemplates a pipe line from Kansas to the Mesaba iron range which would take about 150,000 tons of pipe, but orders for the steel are possibly a long way off. The Texas Co. has placed 3500 tons of 8 and 10-in. pipe for a 75-mile line.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	Sept. 20, 1938	Sept. 13, 1938	Aug. 23, 1938	Sept. 21, *1937
Rails, heavy, at mill	*$40.00*	$42.50	$42.50	$42.50
Light rails: Pittsburgh, Chicago, Birmingham	40.00	40.00	40.00	43.00
Rerolling billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Sheet bars: Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point	34.00	34.00	34.00	37.00
Slabs: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Forging billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham	40.00	40.00	40.00	43.00
Wire rods: Nos. 4 and 5, Pittsburgh, Chicago, Cleveland	43.00	43.00	43.00	47.00
Skelp, grvd. steel: Pittsburgh, Chicago, Youngstown, Coatesville, Sparrows Point, cents per lb.	1.90	1.90	1.90	2.10

Finished Steel

Cents Per Lb.:				
Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.25	2.25	2.25	2.45
Plates: Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont	2.10	2.10	2.10	2.25
Structural shapes: Pittsburgh, Chicago, Gary, Buffalo, Bethlehem, Birmingham	2.10	2.10	2.10	2.25
Cold finished bars: Pittsburgh, Buffalo, Cleveland, Chicago, Gary	2.70	2.70	2.70	2.90
Hot rolled strip: Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown, Birmingham	2.15	2.15	2.15	2.40
Cold rolled strip: Pittsburgh, Cleveland, Youngstown	2.95	2.95	2.95	3.20
Sheets, galv., No. 24: Pittsburgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown, Birmingham	3.50	3.50	3.50	3.80
Hot rolled sheets: Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown	2.15	2.15	2.15	...
Cold rolled sheets: Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown	3.20	3.20	3.20	...

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Cents Per Lb.:	Sept. 20, 1938	Sept. 13, 1938	Aug. 23, 1938	Sept. 21, *1937
Wire nails: Pittsburgh, Chicago, Cleveland, Birmingham	2.45	2.45	2.45	2.75
Plain wire: Pittsburgh, Chicago, Cleveland, Birmingham	2.60	2.60	2.60	2.90
Barbed wire, galv.: Pittsburgh, Chicago, Cleveland, Birmingham	3.20	3.20	3.20	3.40
Tin plate, 100 lb. base box: Pittsburgh and Gary	$5.35	$5.35	$5.35	$5.35

*Pittsburgh prices only.

Pig Iron

Per Gross Ton:				
No. 2 fdy., Philadelphia	$21.84	$21.84	$21.84	$25.76
No. 2, Valley furnace	20.00	20.00	20.00	24.00
No. 2, Southern Cin'ti	20.06	20.06	20.06	23.69
No. 2, Birmingham	16.38	16.38	16.38	20.38
No. 2, foundry, Chicago†	20.00	20.00	20.00	24.00
Basic, del'd eastern Pa.	21.34	21.34	21.34	25.26
Basic, Valley furnace	19.50	19.50	19.50	23.50
Malleable, Chicago†	20.00	20.00	20.00	24.00
Malleable, Valley	20.00	20.00	20.00	24.00
L. S. charcoal, Chicago	28.34	28.34	28.34	30.04
Ferromanganese, seab'd carlots	92.50	92.50	92.50	102.50

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh.	$15.25	$15.25	$15.50	$18.75
Heavy melting steel, Phila.	14.25	14.25	14.25	18.75
Heavy melting steel, Ch'go.	*13.25*	13.75	13.75	17.25
Carwheels, Chicago	*13.75*	14.25	14.25	18.50
Carwheels, Philadelphia	17.25	17.25	17.25	20.75
No. 1 cast, Pittsburgh	15.50	15.50	15.25	19.75
No. 1 cast, Philadelphia	16.25	16.25	16.25	20.25
No. 1 cast, Ch'go (net ton)	*12.75*	13.25	13.25	14.00
No. 1 RR. wrot., Phila.	15.25	15.25	15.25	20.75

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.75	$3.75	$3.75	$4.25
Foundry coke, prompt	4.75	4.75	4.75	5.00

Non-Ferrous Metals

Cents per Lb. to Large Buyers:				
Electrolytic copper, Conn.	**10.375**	10.125	10.125	14.00
Lake copper, New York	**10.50**	10.25	10.25	14.12½
Tin (Straits), New York	**43.70**	42.75	42.875	59.75
Zinc, East St. Louis	**4.95**	4.75	4.75	7.25
Zinc, New York	**5.34**	5.14	5.14	7.60
Lead, St. Louis	**4.95**	4.75	4.75	6.35
Lead, New York	**5.10**	4.90	4.90	6.50
Antimony (Asiatic), N. Y.	14.00	14.00	14.00	18.25

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
September 20, 1938	2.286c. a Lb.	$19.61 a Gross Ton	$14.25 a Gross Ton
One week ago	2.300c.	19.61	14.42
One month ago	2.300c.	19.61	14.50
One year ago	2.512c.	23.25	18.25
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.	Based on average basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1938	2.512c., May 17	2.300c., July 6	$23.25, June 21	$19.61, July 6	$14.83, Aug. 9	$11.00, June 7
1937	2.512c., Mar. 9	2.249c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30	12.92, Nov. 16
1936	2.249c., Dec. 28	2.016c., Mar. 10	19.73, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.062c., Oct. 1	2.056c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 23
1934	2.118c., Apr. 24	1.945c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.953c., Oct. 3	1.792c., May 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.915c., Sept. 6	1.870c., Mar. 15	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	1.981c., Jan. 13	1.883c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.192c., Jan. 7	1.962c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.223c., Apr. 2	2.192c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.192c., Dec. 11	2.142c., July 10	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 17	13.08, Nov. 22

. . . PITTSBURGH . . .

. . . Rails and track materials reduced by Carnegie-Illinois . . . Other prices reaffirmed for fourth quarter . . . Tin plate unchanged to end of year . . . Business gaining slowly over August volume.

PITTSBURGH, Sept. 20.—As expected, current prices on major steel products have been reaffirmed for fourth quarter delivery. Exceptions were track materials which were reduced effective immediately as follows: standard rails, down $2.50 a ton; tie plates, down $3; track bolts, down $4; splice bars, down $2; cut spikes, down $3, and screw spikes, down $5.

Tin plate prices have been reaffirmed for fourth quarter delivery only, which action leaves the door open for revisions later in the year should conditions warrant.

The new prices on rails and track materials, as announced by the Carnegie-Illinois Steel Corp. today (Sept. 20), are as follows:

Standard rails, 60 lb. and heavier, $40 a gross ton, f.o.b. Gary, Ind., or Bessemer, Pa., mills.

No. 2 rails, $38 a gross ton, f.o.b. Gary, Ind., or Bessemer, Pa., mills.

Standard splice bars for "T" rails over 60 lb. per yd., billet steel, $2.70 per 100 lb. f.o.b. Gary, Ind., or Bessemer, Pa., mills.

Cut spikes, $3 per 100 lb., f.o.b. Pittsburgh or Chicago.

Screw spikes, $4.55 per 100 lb., f.o.b. Pittsburgh or Chicago.

Track bolts, $4.15 per 100 lb., f.o.b. Pittsburgh or Chicago.

Tie plates, $43 a net ton, f.o.b. Pittsburgh or Chicago.

With no change in most steel prices, consumers probably will adhere to hand-to-mouth buying policies, thus making prompt delivery an important factor in obtaining steel orders.

Steel bookings so far this month are generally ahead of those in the same period last month. Volume of orders in the past week was a shade larger than a week ago. Further increases, however, may depend to a large extent on automotive purchases, as miscellaneous demand is about balanced with ultimate consumption. Expansion in the latter category will be tuned to general business improvement.

Steel ingot output in the Pittsburgh district is up three points this week to 38 per cent of capacity, while the Wheeling-Weirton district has gained nine points to 76 per cent, owing to resumption of a bessemer converter.

Pig Iron

Rumors of higher prices for the fourth quarter persist but as yet no formal announcement has been made. Meanwhile, local producers for some time have been accepting business for fourth quarter delivery at current prices. Shipments so far this month are ahead of the comparable period last month, there being a slight increase in the number of consumers and tonnages involved.

Semi-Finished Steel

As expected, current quotations have been reaffirmed for fourth quarter delivery. Business is holding up fairly well but total bookings are slightly less than a week ago. Skelp is moving briskly.

Bars, Plates and Shapes

Hot rolled bar prices are unchanged for fourth quarter delivery. Business so far this month continues to run ahead of the corresponding period last month owing to some automotive support, although miscellaneous demand continues to serve as a cushion. Structural plate and shape prices are unchanged for fourth quarter delivery. Inquiries in the past week, although individually small, increased considerably in number and for the most part represented publicly financed projects. American Bridge recently booked 6000 tons of material for a bridge at Redding, Cal.

Reinforcing Bars

Published quotations on reinforcing bars have been renamed for fourth quarter delivery. Prices continue to be somewhat firmer than was the case a month ago. An award is expected momentarily on the Red Hook housing structure at New York involving 4800 tons of bars.

Cold Finished Bars

Cold finished carbon bar prices are expected to be reaffirmed this week for fourth quarter delivery. Business so far this month is running ahead of the comparable period last month due in some measure to automotive support. Other sources are slightly more active but tonnages continue to be far from satisfactory.

Tin Plate

Contrary to general expectations, tin plate prices have been reaffirmed for fourth quarter delivery only. Since the usual practice is to announce a price which holds for a full year, it was probably thought advisable to await a clarification of the foreign situation and in the meantime reaffirm for a short period, thus giving producers an additional few months before making a long term commitment.

Tubular Goods

Texas Co. has purchased 75 miles of 8 and 10-in. pipe, totaling approximately 3500 tons, for a line in Illinois. A large part of this tonnage is expected to be fabricated in the Youngstown district. Since tubular products as a rule are not sold on a quarterly basis, no price announcements are expected, although tonnages would probably be accepted for fourth quarter delivery at current quotations. Oil-country goods specifications are a

Weekly Booking of Construction Steel

	Week Ended				Year to Date	
	Sept. 20, 1938	Sept. 13, 1938	Aug. 23, 1938	Sept. 21, 1937	1938	1937
Fabricated structural steel awards	66,590	17,300	33,600	11,210	602,720	845,395
Fabricated plate awards	1,555	470	1,500	11,665	97,475	101,315
Steel sheet piling awards	1,150	0	150	0	35,060	36,815
Reinforcing bar awards	17,910	7,700	15,650	6,970	233,915	210,315
Total Letting of Construction Steel	87,205	25,470	50,900	29,845	969,170	1,193,840

shade better than a week ago while standard pipe demand is also slightly greater.

Sheets and Strip

Current sheet and strip prices have been reaffirmed for fourth quarter delivery in line with expectations. Orders in the past week increased somewhat, owing to placement of automotive tonnages. Miscellaneous demand continues widely diversified. Stove manufacturers have been more active recently.

Wire

Fourth quarter prices on wire products will be unchanged from current quotations. Meanwhile, total business is holding up exceptionally well and, although increases are not at the same rate as a few weeks ago, recent improvement is holding.

Railroad Buying

The leading producer has reduced prices on track materials, effective immediately and for fourth quarter delivery, as follows: Standard rails down $2.50 a ton; splice bars down $2; cut spikes down $3; screw spikes down $5; track bolts down $4; and tie plates down $3.

. . BIRMINGHAM . .

. . . 14 blast furnaces now active . . . Steel production steady.

BIRMINGHAM, Sept. 20.—Fourteen blast furnaces are now active in the Birmingham district. Last week Woodward Iron Co. blew in its third stack and now has all of its furnaces in operation. For some weeks Republic Steel Corp. has also been operating all three of its furnaces. Tennessee Coal, Iron & Railroad Co. continues to operate six and Sloss-Sheffield Steel & Iron Co. two.

Thirteen open hearths were in production last week and the same number is scheduled for this week. Six are at Fairfield, three at Ensley and four at Gadsden.

Sheet demand is still strong. New tonnage in wire products is tapering off a little. There has been fair business in plates and structural shapes.

Pig iron buying is light because of previous bookings. Shipments are holding at a steady rate.

. . . . CHICAGO . . . .

. . . Ingot output at 44 per cent . . . New business fails to show expected increase this month . . . Rails and track supplies reduced, other prices reaffirmed . . . Labor troubles a disturbing factor.

CHICAGO, Sept. 20.—A rise in ingot output of two points to 44 per cent of capacity reflects increased operating schedules at two district mills and the maintenance of last week's rate at the plants of the three other major producers.

Sales last week ranged from 15 to 20 per cent less to just slightly better than those of the previous week. A lack of interest seemingly has developed for which there is no apparent reason. The confirmation of current prices for fourth quarter was expected, so could have little bearing on such a decline. Fear of the European situation could conceivably distress some buyers, but since miscellaneous business has lately been chiefly responsible for the bulk of the sales, and none of the major consuming sources has been outstanding, this is considered unlikely.

Orders still are confined to present needs. Users obviously do not believe the time is near when business will improve to the extent that mills will be crowded and deliveries delayed.

Lower prices for rails and track accessories may be an incentive to the carriers to open up and fill their known needs.

Labor is again becoming a disturbing factor. Strikes at the Kenosha, Wis., Nash plant have prevented transportation of necessary dies and equipment to Racine, where production is being concentrated as an economy measure. The Harnischfeger Corp. plant in Milwaukee has been closed tight for over two weeks because of what is said to be union objection to an economy pay reduction.

Scrap prices have declined 50c. a ton as a result of sales to an independent producer at $13.50, heavy melting steel now being quoted at $13 to $13.50.

Pig Iron

Shipments are about 15 per cent ahead of last month to date. Foundry coke movement is running a little behind August, but most of the melters here are on a four to five day week basis, as against two and three days in July and August. The better showing of iron is caused mostly by a few large consumers who produce their own coke, and to some good coke accounts that are down temporarily.

Rails and Track Accessories

With these products the only finished steel items to be reduced for fourth quarter shipment, it might reasonably be assumed that more business will be seen from the carriers soon. Since very little steel buying of any kind has been coming from the roads recently, mills probably will not lose a great deal even if the cut fails to result in new orders. Angle bars are down $2 a ton, rails $2.50, spikes and tie plates $3 and track bolts $4 a ton.

Wire and Wire Products

Sales, both of merchant products and manufacturing wire, continue to improve. Sales reports from the East appear more optimistic than those in this vicinity, but Mid-West offices expect gradual betterment during the fall months.

Structural Shapes and Reinforcing Bars

Construction lettings in the past week have dropped sharply for no apparent reason. Prices of fabricated shapes are shaky, but reinforcing quotations are becoming firmer. Even the small jobs, which for a time were occupying most bar mills, are falling off. Fabricators can feel little optimism until more private projects are up for bids.

Sheets and Strip

A slight upturn in farm equipment tonnage is being seen currently, but automobile orders are not yet in expected volume. Culvert makers are fairly active, as are stove builders. Strip sales are improving steadily, all sizes being affected by a wide range of consuming industries.

Plates

As most of the steel for the Illinois Central cars has been ordered, this market is back in the doldrums as far as railroad interest is concerned. Fabricating and tank building activity is only fair.

REINFORCING STEEL

NORTH ATLANTIC STATES

AWARDS

5000 Tons, Brooklyn, N. Y., superstructures, Red Hook housing project, to Bethlehem Steel Co., Bethlehem, Pa., through George A. Fuller Co., New York, contractor.

792 Tons, Queens, N. Y., elevated highway and approaches, 45th to 64th Streets, to Bethlehem Steel Co., Bethlehem, Pa., through Elmhurst Contracting Co., Inc., contractor.

300 Tons, Brooklyn, Cropsey Avenue sewer, to Igoe Brothers, Inc., Newark, N. J., through P. Tomasetti Contracting Co., Brooklyn, contractor.

250 Tons, Central Islip, N. Y., patients buildings and staff apartment buildings, Department of mental hygiene, hospital, to Bethlehem Steel Co., Bethlehem, Pa., through Turner Construction Co., New York, contractor.

150 Tons, Norfolk, Va., 26th Street bridge over Lafayette River, to Bethlehem Steel Co., through Tidewater Construction Co., Norfolk, general contractor.

110 Tons, New York, East River Drive, contract No. 2, to Bethlehem Steel Co., through Madden & Lane, contractors.

CENTRAL AND WESTERN STATES

3750 Tons, Los Angeles, Hansen Dam, to Ceco Steel Products Co., Los Angeles, through Guy F. Atkinson, San Francisco, general contractor.

3200 Tons, or more, Los Angeles, parcel post terminal annex, to Soule Steel Co., Los Angeles, through Sarver & Zoss, Los Angeles, general contractors.

2000 Tons, Los Angeles, flood control work by United States Engineer (Proposal 132), to Bethlehem Steel Co., Los Angeles.

418 Tons, San Francisco, work at Fort Cronkhite (Invitation 868-39-69), to Soule Steel Co., San Francisco.

350 Tons, Fort Sheridan, Ill., barracks, to Concrete Steel Co., through George Sollitt Construction Co., Chicago.

314 Tons, Yosemite, Cal., bridges and tunnel lining, to Soule Steel Co., San Francisco, through John Rocca, San Rafael, Cal., general contractor.

220 Tons, Pinole, Cal., overpass, to Gunn-Carle & Co., San Francisco, through Union Paving Co., San Francisco, general contractor.

211 Tons, Eldridge, Cal., Units 3 and 4, State Home, to Gunn-Carle & Co., San Francisco, through Carl Swenson, San Jose, Cal., general contractor.

156 Tons, Bramwell, Idaho, Boise-Payette project (Invitation A-21113-A), to Colorado Fuel & Iron Co., Denver.

153 Tons, Bramwell, Idaho, Boise-Payette project (Invitation A-21107-A), to Columbia Steel Co., San Francisco.

130 Tons, Fort Douglas, Utah, barracks, to Soule Steel Co.; Jacobson Contracting Co., Salt Lake City, general contractor.

108 Tons, Sacramento, courthouse and jail addition, to Ceco Steel Products Co., San Francisco, through W. C. Keating, general contractor.

100 Tons, Richmond, Cal., post office, to W. S. Wetenhall Co., San Francisco, through James I. Barnes, Santa Monica, Cal., general contractor.

100 Tons, Oakland, Cal., Industrial Home for the Blind building, to Gunn-Carle & Co., San Francisco.

NEW REINFORCING BAR PROJECTS

NORTH ATLANTIC STATES

5300 Tons, Queens, N. Y., Queensbridge housing project.

1500 Tons, Boston, Huntington Avenue subway extension. A PWA project.

1366 Tons, Boston, U. S. Treasury Department, procurement division.

575 Tons, Washington, Calvin Coolidge school.

500 Tons, Pittsburgh, 33rd Street sewer.

325 Tons, Saranac Lake, N. Y., mostly mesh, highway project R.C. 3989; bids close Oct. 4.

300 Tons, Ayer, Mass., barracks, Ft. Bevan.

150 Tons, Homer, N. Y., mostly mesh, highway project 8522; bids close Oct. 4.

140 Tons, Penn Yan, N. Y., mesh, highway project R.C. 3991; bids close Oct. 4.

CENTRAL AND WESTERN STATES

4700 Tons, Los Angeles, Palos Verdes feeder of Colorado River aqueduct (concrete pipe alternate); bids Oct. 4.

1500 Tons, Cleveland, west approach, Main Street bridge, Sam Emerson & Co., low bidder.

400 Tons, Wayne Township, Pickaway County, Ohio, three concrete slab bridges over Scito River, for State of Ohio, bids Sept. 23. Also 3794 feet metal railing.

380 Tons, Winona, Minn., Froeder Grain & Malting Co. building.

344 Tons, Chicago, breakwater, 79th Street.

280 Tons, Milwaukee, Froeder Grain & Malting Co. building.

170 Tons, Cedar Rapids, Iowa, Wilder Grain Co. building.

160 Tons, Ft. Wayne, Iowa, Perfection Biscuit Co. building.

150 Tons, San Diego, Cal., hospital building at Vauclain Home, bids opened.

143 Tons, Crownober, Wash., Yakima-Roza project; bids opened.

128 Tons, Verdi, Nev., highway work, bids Oct. 9.

118 Tons, Blackhawk, Colo., highway work, bids Sept. 23.

125 Tons, Bloomington, Ind., state farm, Mutual Insurance Co.

100 Tons, Minneapolis, Church of Christ.

100 Tons, Mankato, Minn., Mankato Teachers College.

..CAST IRON PIPE..

Portland, Me., will shortly be in the market for 48-in. pipe to run from that city to Sebago Lake. The project will cost $1,676,700, of which the PWA has granted $754,290. Harry V. Fuller, 16 Casco Street, Portland, is the engineer.

Providence, R. I., has plans in progress for waterworks improvements at Scituate, R. I., to cost $969,732, of which the PWA has granted $436,379. Plans are private.

Newton, Mass., will shortly be in the market for pipe. Current plans involve $105,000, of which a grant of $42,250 has been made by the PWA. Weston & Samson, 14 Beacon Street, Boston, are the engineers.

Bath, Me., contemplates a new water main to cost $130,000, of which the PWA has granted $58,500. Bids will be asked about Oct. 10. Fay, Spofford & Thorndike, 11 Beacon Street, Boston, are the engineers.

Foxboro, Mass., will be in the market the last of this month for pipe, pumps, standpipe, etc., at a cost of $74,800, of which the PWA has granted $34,110. Whitman & Howard, 89 Broad St., Boston, are the engineers.

Fond du Lac, Wis., closed bids Sept. 21 on 1500 lineal ft. of 4, 8 and 10-in. water pipe and quantity of fittings.

Manitowoc, Wis., has let general contract for submarine water main under Manitowoc River to McMullen & Pitz Co., local, at $24,979.

Tucson, Ariz., has awarded 1200 ft. of 12-in., 14,150 ft. of 6-in., 7750 ft. of 4-in. pipe and 24,000 lb. of fittings to United States Pipe & Foundry Co., San Francisco, through Williams & Van Valkenburg, Los Angeles, general contractor.

Glen Ellyn, Ill., plans pipe lines for water system and other waterworks installation. Cost about $77,400. Financing is being arranged through Federal aid.

Sandusky, Ohio, has received bids on 750 tons of 24-in. cast iron water pipe. Chirstopher Co., Chagrin Falls, Ohio, is low bidder.

Marietta, Ohio, plans early call for bids for pipe lines for water system; also new water treatment plant and other waterworks installation. Cost about $500,000. Burgess & Niple, 568 East Broad Street, Columbus, Ohio, are consulting engineers.

Electra, Tex., plans pipe lines for water system extensions and replacements, and other waterworks installation. Cost about $90,000. Financing is being arranged.

Louisburg, Kan., plans pipe lines for water system and other waterworks installation, including elevated steel tank and tower. Cost about $95,000. Special election has been called Sept. 30 to approve bonds for $52,250, remainder of fund to be secured through Federal aid. Shockley Engineering Co., Graphic Arts Building, Kansas City, Mo., is consulting engineer.

Stoughton, Mass., plans pipe lines for extensions in water system. Also new elevated steel tank and tower, and other waterworks installation. Cost about $65,000. Financing has been arranged through Federal aid. Fay, Spofford & Thorndike, 11 Beacon Street, Boston, are consulting engineers.

Princeton, Ill., plans pipe lines for waterworks extensions and replacements. Cost about $51,000. Financing is being arranged through Federal aid.

Wellington, Mo., plans pipe lines for water system, including elevated steel tank and tower, iron removal plant and other waterworks installation. Cost about $42,700. Special election has been called Sept. 30 to approve bonds for $23,500, remainder of fund to be secured through Federal grant. Shockley Engineering Co., Graphic Arts Building, Kansas City, Mo., is consulting engineer.

Phoenix, Ariz., plans about 9½ miles of 36-in. for main water supply line. Also extensions and replacements in distributing mains and other waterworks installation. Cost about $760,000. Special election has been called Sept. 27 to approve bond issue in amount noted.

Orem, Utah, plans extensions and replacements in pipe lines for water system, and other waterworks improvements. Cost about $35,600. Financing is being arranged through Federal aid.

Claremore, Okla., plans pipe lines for extensions in water system, including main 12-in. from filter station to present water tank; also new elevated steel tank and tower and pumping equipment. Cost about $50,000. Financing is being arranged through Federal aid. Holway & Neuffer, 302 East Eighteenth Street, Tulsa, Okla., are consulting engineers.

. . . CLEVELAND . . .

. . . Ingot output rises slightly in Ohio districts . . . Reaffirmation of prices on major products expected to result in continuance of hand-to-mouth buying.

CLEVELAND, Sept. 20.—The ingot rate for Youngstown and nearby cities is this week up one point to 43 per cent, and output in the Cleveland-Lorain area shows a gain of two points to 51 per cent.

Reaffirmation of prices on principal steel mill products, except rails and track accessories, for fourth quarter, including wire, was logical in view of the postponed ruling on wages by the Government Contracts Board. The decision on the price of contract tin plate for 1939 is put off until later this year and shows the desire of mills for further deliberation on the subject.

From all indications, hand-to-mouth buying which has been the practice during the past 12 months, can be expected to continue. Price tests may crop up frequently.

Recent business for mills in this vicinity includes a large export order for wire, sheets for Russia, plates for an Eastern shipbuilder, and some Government work.

Sheet mill employees at Cleveland are beginning to receive pay on a tonnage basis due to increased operations.

Iron ore consumption during August rose above the 2,000,000 ton mark for the first time since last November. Ore schedules of some ownership mines have been revised upward.

Pig Iron

While shipments are about equal to those of the comparable August period, producers hold to the belief September may show a slight gain. An unimpressive volume of fourth quarter business has been accepted. There has been very little demand from the Continent recently, but Japan is said to be still interested in buying iron here.

Iron Ore

Iron ore consumption by furnaces increased about 400,000 tons during August, according to the Lake Superior Iron Ore Association. The total amount used, 2,076,819 gross tons, compares with 1,674,721 in July, and 5,373,264 in August, 1937. On hand at furnaces and Lake Erie docks Sept. 1 were 37,050,338 tons, compared with 35,846,160 on Aug. 1 and 35,343,209 on Sept. 1, 1937. There were 68 furnaces depending principally on Lake Superior ore in blast Aug. 31, compared with 59 on the last day of July and 156 on Aug. 31, 1937.

Bars, Plates and Shapes

Activity in plates is strong here, with production centered upon ½-in. material for an Eastern shipbuilder. The 1000-ton, 42-in. pipe line for Sandusky, Ohio, will be rebid Sept. 28. Reinforcing bar inquiries include 400 tons for a State bridge in Pickaway County. Due to the forging, machinery and automotive industries, hot rolled bar orders so far this month are showing a slight edge over August. Reaffirmation of present prices for fourth quarter had generally been expected.

Sheets and Strip

Demand for current use by miscellaneous consumers is predominant, but mills are also active on automotive business and a few export orders. Russia accounts for the largest share of the foreign bookings, while requirements of Hudson and Packard are among the largest from the auto industry right now.

Bolts, Nuts and Rivets

Increased hesitancy has been noted in new business, possibly due to the unsettled European situation. Bolt, nut and cap screw orders have fallen off during the past week. Rivet prices have been reaffirmed for the fourth quarter by leading makers.

Wire and Wire Products

Current prices of rods, wire and wire products have been reaffirmed for fourth quarter delivery. New business so far this month is slightly ahead of the comparable August period, although below expectations. Export demand has picked up, one large order being booked by a producer in this vicinity.

CANADA

. . . Further contracting for munitions expected in the Dominion.

TORONTO, Sept. 20.—Steel interests continue to predict general improvement in sales before the end of the year. Minor speeding up in operations is noted, and a number of companies are preparing for further increases in operations. Demand for machinery and tools continues fairly heavy. Inquiries for machine tools are increasing and many are of the opinion that additional large contracts for steel, shells, guns and other war supplies will soon be announced for Canada both from the Canadian Government and from Great Britain and France.

So far there has been no suspension of exports of iron ore to Germany from the Wabana, Newfoundland, mines of Dominion Steel & Coal Corp.

Demand for merchant pig iron again showed a minor gain for the week. Two furnaces are expected to blow in within the next month or two.

Trading in iron and steel scrap is becoming more active. During the past week or two larger tonnages of scrap have been moving in and out of dealers' yards.

....BUFFALO....

. . . Ingot production unchanged . . . 21 open hearths active.

BUFFALO, Sept. 20.—Operations are unchanged, with 21 open-hearths active in the area. Of these, Bethlehem Steel Co. has 15 on, Republic Steel Corp., four, and Wickwire-Spencer, two.

A new plant to be erected for the Spencer Lens Co., Buffalo, will require 600 tons of structural steel. Bids are due Sept. 20. Contract for an addition to the hospital at Lockport, N. Y., was awarded to the Gambin Construction Co.; 100 tons of shapes will be needed.

. . PHILADELPHIA . .

. . . Sheet and strip releases by automobile parts makers accelerated . . . Tubular goods sales slightly better . . . Scrap quotations unchanged.

PHILADELPHIA, Sept. 20.—New business booked in the past week was in slightly better volume than in the preceding week, but was still far below the level that had been expected at this time. So far this month, general business is just about equal to the volume of the like period of August.

The slow improvement in private industry here is adding emphasis to the importance of publicly financed work. The latest development along this line is the State's new school building program. This plan provides for the construction of schools by the State which will be leased to school districts. An institutional program now under consideration by the State authorities calls for the expenditure of $30,000,000 for new public buildings. Both these programs are expected to provide an outlet for substantial tonnages of shapes and concrete bars.

The scrap market is very quiet and prices are unchanged on open-hearth grades. Mill purchases are being held to the absolute minimum.

Operations for the current week are estimated at 28 per cent of capacity, unchanged from the previous week.

Pig Iron

Releases against old orders showed a slight upturn in the past week due to a small but general improvement in foundry operations here. New business, however, is very limited. The price situation remains in status quo, with several sellers apparently willing to book fourth quarter business at present prices without formal announcement of policy.

Plates and Shapes

New plate business in the past week showed little change in volume as compared with the preceding week. Small tonnages are being released by the Chester shipbuilder, but these supplies are for repair work and do not cover the new work recently booked by this builder. Awards of fabricated shapes in the past week were the lightest in some time, but pending tonnages are fairly heavy due particularly to alterations and additions to the local Navy yard requiring about 2200 tons.

Sheets and Strip

Sheet buying by district automobile parts makers has increased in volume lately. The strike at the Briggs' plant in Detroit is expected to throw added work on parts makers here and in view of the low stock at these plants this increased activity will undoubtedly be immediately reflected in still better buying. The recent improvement in hot rolled strip specifications may also be traced to these same consumers. The new General Motors plant at West Trenton has purchased a small tonnage of both sheets and strip for die tryouts.

Tubular Goods

The volume of tubular goods sales has been slowly rising because of the better demand for oil-country items that has developed over the past several weeks. Further improvement of a seasonal nature is expected in standard pipe demand as the heating season gets under way.

Warehouse Business

Warehouse sales so far this month, on a tonnage basis, are running about level with a like period in August, but the turnover on a dollar basis is slightly less. The present light call for warehouse products is well diversified. Despite the reductions on Aug. 1, prices are far from steady. Sheet items, especially, have shown sharp deviations from published prices.

Imports

During the past week 38 tons of steel angles, 2 tons of sheets, 15 tons of steel bars and 25 tons of steel bands were received here from Belgium. From Poland came 230 tons of ferromanganese. Sweden shipped to this port 117½ tons of tubes teel, 25 tons of steel forgings and 8 tons of steel bars.

. . . .PIPE LINES. . . .

Bureau of Reclamation, Denver, asks bids Sept. 22 on 380,000 ft. of 1-in. O.D. black steel pipe or tubing for use at Columbia Basin project, Odair, Wash.

Texas Pipe Line Co., Houston, Tex., affiliated with Texas Co., same address, plans new welded steel pipe line from Salem, Ill., in recently opened oil field area in southern part of State, to Lawrenceville, Ill., about 80 miles, for crude oil transmission. Connection will be made at last noted point with main pipe line system of company in this district. About 60 miles of new line will be 8-in., and 20 miles of 10-in. Pumping stations will be installed at points along route for booster service. Cost over $500,000. Executive offices of parent company are at 135 East 42nd Street, New York.

General Purchasing Officer, Panama Canal, Washington, asks bids until Sept. 30 for 68,000 lin. ft. of welded steel pipe and 6000 lin. ft. of welded pipe (Schedule 3384).

Quemado, Tex., plans pipe lines for municipal natural gas distributing system. Cost about $41,000. Financing is being arranged through Federal loan and grant. Worth Stewart, mayor, is in charge of project.

Hope Engineering Co., 100 East 42nd Street, New York, plans new 8 or 10-in. welded steel pipe line from K-M-A oil field area in northern part of Texas to a point on Gulf coast, for crude oil transmission. Large bulk terminal will be located in last noted district for barge shipments. Oil will be secured from wells of independent operators in K-M-A district covering about 10,000 acres and steel pipe line gathering system will be installed. Contracts are now being made with operators, and work on pipe line is scheduled to begin when a minimum of 300 wells has been secured.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 30 for quantity of corrosion-resisting steel pipe and tubing for Eastern and Puget Sound, Wash., navy yards (Schedule 4371).

Sandusky, Ohio, has received bids on 1000 tons of 42-in. steel pipe for an intake. National Construction Co., Cleveland, low bidder.

RAILROAD BUYING

Chicago & Illinois Midland has placed a contract for the rebuilding of 100 gondola cars with Pullman-Standard Car Mfg. Co.

The Milwaukee Road main shops at Milwaukee have switched from the production of passenger coaches to the construction of 500 new flat cars. Six cars a day will be turned out, with the program to be completed in November. The flat cars are of all-welded steel construction, with wooden platforms, and each will be 52½ ft. long and 10 ft. 4 in. wide, compared with a 50 ft. length and 9 ft. width of flat cars now in service. It is understood that the new cars will be the first in the United States of welded construction. The passenger car program has been completed, with 61 coaches built instead of the 55 units originally included in the budget.

The Southern Railway has filed details for authority to sell $500,000 in equipment trust certificates to the RFC to apply on the purchase of four steel diesel electric passenger trains to be built by the St. Louis Car Co. at a total cost of $536,600. Each train will consist of an 80-ft. steel diesel electric combined mail-baggage and parlor car and a 63-ft. 10-in. steel passenger coach.

. . . .NEW YORK. . . .

. . . New steel business at a slower pace . . . European situation a possible factor in continuance of tin plate price . . . Reductions in rails and accessories may hasten New York Central purchases.

NEW YORK, Sept. 20. — Although some large orders have been placed, notably 50,000 tons of fabricated structural steel for the Metropolitan Life Insurance Co.'s housing project in the Bronx, which went to Bethlehem Steel Co., the trend of miscellaneous business has not been conspicuously upward. At best, the volume of orders has been just about holding its own compared with the record of recent weeks. Another sizable order was about 3500 tons of 8 and 10-in pipe placed by the Texas Co. for a pipe line.

The reaffirmation of prices on the major steel products, with reductions on rails and track accessories, was no surprise, having been in line with expectations, but the news that tin plate prices would be continued without change through the fourth quarter did cause surprise, as a reduction had been generally expected. No official explanation has been given as to the reasons for the decision to carry over the present prices into the coming quarter, but it is assumed that the unsettled European situation may have been a factor, as a war would undoubtedly bring a big rise in tin prices. As the contract period for tin plate for packers' cans runs from Jan. 1 to Sept. 30, a definite decision on tin plate prices for next year is thus postponed until November or December.

The reduction in prices of rails and track accessories is of particular interest in this district, as the only prospective buying of importance is that scheduled by the New York Central, which may soon issue an inquiry for 28,600 tons of rails and the necessary accessories.

Pig Iron

Although there has been an expectation of a $1 a ton advance in pig iron prices, no action has been taken. New orders have been substantially higher in the past week. Several furnaces report several orders averaging 200 to 300 tons apiece, and at least one order ran over 500 tons. Export business is light, although inquiries continue to come in from Scandinavia. Shipments are running ahead of the same period in August, and the indications are that foundry melt is on the increase, particularly among New Jersey jobbing foundries.

Plates and Sheets

Miscellaneous plate volume continues very small. Tank builders are slowing up in issuing specifications. Although no official announcement has been made, it is generally accepted in the trade that the 30 scows for the Department of Sanitation will be equally divided among Brewer Dry Dock Co. of Staten Island, Bethlehem Steel Co.'s United yards in Brooklyn, and the Dravo Corp., Pittsburgh. Commitments have already been made for the 9000 tons of plates and shapes involved in the total contract. Bethlehem was also awarded the contract for an elevated highway in Queens Borough of New York City, totaling 7000 tons, of which a substantial portion will be plate material for girders and flooring.

Sheet sellers are none too enthusiastic about the present volume, which for many has shown a decrease following the holiday week. Galvanized is not moving well and jobbers seem to be more in need of hot and cold rolled sheets. Price cuts on jobber galvanized sheets are being made to move material that has been in the warehouse for a year or more. Stove makers continue to be the most active accounts of several sellers in this district.

Reinforcing Bars

Tonnages involved in awards placed in the week past were up substantially from the previous week's level, due principally to the awarding of the bar requirements of the Red Hook housing project, estimated at 5000 tons. This order was booked by Bethlehem Steel Co. The Queensbridge housing project, similar in scope to the Red Hook development, will be out for bids early in October. Requirements for this job are placed at 5300 tons. Small-lot competition is becoming increasingly severe and quotations on larger lots are still subject to sizable concessions.

. . .CINCINNATI. . .

. . . Sheet demand gains; week's orders equal to 50 per cent of capacity.

CINCINNATI, Sept. 20.—Increased automotive demand for finished sheets swelled the week's tonnage to a level near 50 per cent of capacity. Miscellaneous buying shows no downward tendency, although the expansion in this demand is more conservative. Galvanized sheets continue to display unusual activity. Mill operations are about equal to demand.

The pig iron market has bogged down. Releases on contract have been slower and the volume of shipments this month has been less than in August. Approach of the fourth quarter has brought no new contracting. Furnaces report that unexpired third quarter contracts were rewritten since melters had anticipated their last half needs when price reductions were announced. A slight easing in machine tool foundry operations has been offset by small increases in other plants.

. . . .ST. LOUIS. . . .

. . . Pig iron shipments below those of August.

ST. LOUIS, Sept. 20.—Pig iron shipments in September have been below the volume for August at this time. The best news comes from the agricultural belt, one of the largest plants in the tri-cities has reopened on a small scale, but production will be steadily stepped up until the peak of last June is reached, when 1000 men will be employed.

Ingot operations are at 42 per cent of capacity.

The St. Louis plant of the American Car & Foundry Co. will build 1000 steel box cars for the Illinois Central Railway, for delivery early in 1939.

The demand for finished iron and steel is about on a par with the preceding week. Because of large Government-financed projects, there is considerable in the way of inquiries for reinforcing bars. There was a slight pick-up in the demand for sheets.

IRON AND STEEL SCRAP

. . . Scrap average drops 17c. to $14.25 in a listless market, but only real softness is at Chicago.

SEPT. 20.—Only one consumer is in the market in Chicago, but because this mill has made two purchases of No. 1 steel at $13.50, the price of that grade and those of the entire list have been marked down 50c. This is the only market where No. 1 steel has been affected, but the drop has brought THE IRON AGE average down 17c. to $14.25, from $14.42 the week before. In the past six weeks prices have fallen, then risen slightly and fallen again. The net loss of 48c., however, from the Aug. 9 high of $14.83 has been exactly equal to the average weekly rise during the eight-week bull market which first appeared on June 21, so that the present phase may be termed merely an easing off. Sentiment today is strongly influenced by the crisis in Europe, since the last sale to the cartel was a bullish factor and its full effect upon the domestic market is being negated by the current uncertainties abroad. Most district scrap markets are marking time, prices are largely unchanged, and for the moment the trend in domestic scrap markets fails to reflect the steady increase in ingot output.

Pittsburgh

Little or no change in the market situation has occurred in the past week. Undertone continues strong, with demand and supply for the time being fairly well balanced. No. 1 steel has been sold into consumption in the past week within the quoted range which remains unchanged this week at $15 to $15.50. Further sales of railroad steel have also been made during the past week within the quoted range of $16 to $16.50. Tonnages involved, however, were not large.

Chicago

At least two sales at $13.50 have established the price of heavy melting steel at $13 to $13.50 and the entire list has dropped 50c. a ton accordingly. Still only one consumer is in the market and local brokers do not expect much of a rise in prices until more mill interest is shown. Prime steel is being bought at $13 to $13.25.

Philadelphia

The low operating rate and the comfortably stocked position of mills in this district make for a very quiet and inactive market, with prices on open-hearth grades unchanged from the previous week. Shipments against old orders are going forth in moderate volume, but new mill commitments are negligible. A recent sale of heavy breakable scrap brought $16.50 and quotations on this grade have been marked up 50c. to conform to this level. Germany is reported to have recently purchased 40,000 tons at prices equal to those of the recent Italian order.

Youngstown

While open-hearth operations have gained here recently, mill buying of scrap remains in the future. The market appears to have a fairly strong undertone and most dealers claim that they do not want to be short, but whether quotations can be maintained in the absence of tonnage sales is a question.

Cleveland

Gloom pervades the local market after a long period of inactivity which has seldom been equaled here. Prospects for the future are all predicated on incoming business for steel producers, who currently are disappointed in the amount of increase.

Buffalo

The foreign situation is held partly responsible for an unstabilizing influence on the scrap market and a consequent lack of sales. The market continues strong, but no price changes have been reported. Dealers are occupied mainly with previous orders of minor significance.

Cincinnati

Some strengthening of specialty grades in Southern areas for export contributed slight support to dealer feeling in this area. Dealers' bids are unchanged, although sale of scrap is insignificant. Mills tend to watchful waiting while dealers are wary of the market trend.

Detroit

All the items on the Detroit scrap list have shown certain signs of weakness during the last week or 10 days but no serious reaction has taken place yet. Automobile plants and parts plants are speeding production rapidly and the lists offered next month undoubtedly will carry substantial tonnages so a thorough test of the market will be offered before long. On one sale of a few cars of bundles last week, the top price of $12.50 was paid. On brokers' offerings the price of No. 2 heavy melting steel is down 50c. to $8.50, although it is understood that No. 2 will still bring $9 on track for out-of-town shipment. If any items were to be singled out as leading in activity, it would be new busheling, although as far as can be learned no sales are being made at the top price of $11.50.

Boston

Bundled skeleton or busheling for domestic consumption has been advanced 50c. a ton, but no particular change is noted in prices for other materials going to Pennsylvania. Reported better steel mill inquiry for heavy melting steel is not reflected in this market, because prices offered by them are far out of line with the local export market. However, a Phillipsdale, R. I., consumer is paying $12.50 to $13 a ton, delivered, for heavy melting steel, and a Worcester mill has offered $11.50 a ton, delivered, these prices being more in line with the export market. The export market holds strong on last week's price basis, with a good inquiry and prospects of increased shipments within the near future. Forwardings are being made to Italy and Rotterdam, the last shipment to which was 5608 tons.

New York

To the last Cartel order for 80,000 tons for Italy has been added 40,000 tons for Germany at about the same price. This 120,000 tons compares with 370,000 tons on the previous order, which was taken at a much lower price. Broker buying prices are unchanged for export, and news from abroad in the last week has tended to freeze the market at the status quo. Buying prices for material on cars for domestic consumption are also unchanged.

St. Louis

Scrap iron shipments continue steady, as a result of recent heavy commitments for heavy melting steel by steel mills in the St. Louis district, but no large amounts have been sold within the last two weeks. Movement of scrap from the country has been comparatively light.

. . . BOSTON . . .

. . . Pig iron orders in small lots and few.

BOSTON, Sept. 20.—The pig iron market continues a rather drab affair. Current buying is confined to a car lot now and then, mostly for prompt shipment, for mixture purposes or to complete an unexpected casting order taken by some foundry. Nothing has transpired to indicate a change in the situation, either good or bad. The Washburn Wire Co., Phillipsdale, R. I., is operating two furnaces, and operations at Worcester, Mass., and Bridgeport, Conn., mills have increased slightly, but are still well below capacity. War talk has put a damper on the New England business enthusiasm noted a month ago.

Weirton Hearings Resume Sept. 27 at Washington

THE National Labor Relations Board on Tuesday announced that the Weirton Steel Co. hearings have been transferred to Washington and will be resumed Sept. 27 before Trial Examiner James C. Batten who has replaced Edward Grandison Smith.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$15.00 to $15.50
Railroad hvy. mltng..	16.00 to 16.50
No. 2 hvy. mltng. steel	13.75 to 14.25
Scrap rails	16.50 to 17.00
Rails 3 ft. and under..	17.00 to 17.50
Comp. sheet steel	15.00 to 15.50
Hand bundled sheets..	14.00 to 14.50
Hvy. steel axle turn..	13.50 to 14.00
Machine shop turn....	9.50 to 10.00
Short shov. turn.....	9.50 to 10.00
Mixed bor. & turn....	8.25 to 8.75
Cast iron borings.....	8.25 to 8.75
Cast iron carwheels...	14.50 to 15.00
Hvy. breakable cast...	12.50 to 13.00
No. 1 cupola cast.....	15.25 to 15.75
RR. knuckles & cplrs.	17.00 to 17.50
Rail coil & leaf springs	17.00 to 17.50
Rolled steel wheels...	17.00 to 17.50
Low phos. billet crops.	17.50 to 18.00
Low phos. punchings.	16.00 to 16.50
Low phos. plate	16.00 to 16.50

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$14.00 to $14.50
No. 2 hvy. mltng. steel.	12.50 to 13.00
Hydraulic bund., new.	14.00 to 14.50
Hydraulic bund., old..	11.00 to 11.50
Steel rails for rolling.	17.00 to 17.50
Cast iron carwheels...	16.50 to 17.00
Hvy. breakable cast..	16.00 to 16.50
No. 1 cast	16.00 to 16.50
Stove plate (steel wks.)	13.00 to 13.50
Railroad malleable	15.50 to 16.00
Machine shop turn....	8.00 to 8.50
No. 1 blast furnace....	6.50 to 7.00
Cast borings	6.50 to 7.00
Heavy axle turnings..	10.00 to 10.50
No. 1 low phos. hvy...	16.50 to 17.00
Couplers & knuckles..	16.50 to 17.00
Rolled steel wheels	16.50 to 17.00
Steel axles	21.50 to 22.00
Shafting	19.50 to 20.00
No. 1 RR. wrought....	15.00 to 15.50
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire	10.50 to 11.00
Cast borings (chem.)..	9.50 to 10.00

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton
Hvy. mltng. steel	$13.00 to $13.50
Auto. hvy. mltng. steel alloy free	11.50 to 12.00
No. 2 auto. steel	11.00 to 11.50
Shoveling steel	13.00 to 13.50
Factory bundles	12.00 to 12.50
Dealers' bundles	11.50 to 12.00
Drop forge flashings...	9.50 to 10.00
No. 1 busheling	12.00 to 12.50
No. 2 busheling, old...	4.75 to 5.25
Rolled carwheels	15.50 to 16.00
Railroad tires, cut....	16.00 to 16.50
Railroad leaf springs..	16.00 to 16.50
Steel coup. & knuckles	14.50 to 15.00
Axle turnings	12.00 to 12.50
Coil springs	16.50 to 17.00
Axle turn. (elec.)	12.50 to 13.00
Low phos. punchings..	16.00 to 16.50
Low phos. plates 12 in. and under	16.00 to 16.50
Cast iron borings	6.00 to 6.50
Short shov. turn.	7.00 to 7.50
Machine shop turn....	6.00 to 6.50
Rerolling rails	17.50 to 18.00
Steel rails under 3 ft..	16.00 to 16.50
Steel rails under 2 ft..	16.50 to 17.00
Angle bars, steel	15.50 to 16.00
Cast iron carwheels...	13.50 to 14.00
Railroad malleable	14.50 to 15.00
Agric. malleable	10.50 to 11.00
	Per Net Ton
Iron car axles	18.50 to 19.00
Steel car axles	19.00 to 19.50
Locomotive tires	16.00 to 16.50
Pipes and flues	9.00 to 9.50
No. 1 machinery cast.	12.50 to 13.00
Clean auto. cast.	12.00 to 12.50
No. 1 railroad cast....	11.50 to 12.00
No. 1 agric. cast.....	11.00 to 11.50
Stove plate	9.00 to 9.50
Grate bars	9.00 to 9.50
Brake shoes	10.00 to 10.50

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$14.00 to $14.50
No. 2 hvy. mltng. steel.	13.00 to 13.50
Low phos. plate	14.50 to 15.00
No. 1 busheling	13.00 to 13.50
Hydraulic bundles	13.00 to 13.50
Machine shop turn....	9.50 to 10.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$12.50 to $13.00
No. 2 hvy. mltng. steel.	11.50 to 12.00
Comp. sheet steel	12.00 to 12.50
Light bund. stampings	9.00 to 9.50
Drop forge flashings..	10.00 to 10.50
Machine shop turn....	7.00 to 7.50
Short shov. turn.....	7.50 to 8.00
No. 1 busheling	11.00 to 11.50
Steel axle turnings....	10.00 to 10.50
Low phos. billet and bloom crops	17.00 to 17.50
Cast iron borings	7.75 to 8.25
Mixed bor. & turn....	7.75 to 8.25
No. 2 busheling	7.75 to 8.25
No. 1 cast	16.50 to 17.00
Railroad grate bars	9.50 to 10.00
Stove plate	10.00 to 10.50
Rails under 3 ft.	18.50 to 19.00
Rails for rolling	17.00 to 17.50
Railroad malleable	15.00 to 15.50
Cast iron carwheels	14.00 to 14.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$14.00 to $14.50
No. 2 hvy. mltng. steel.	12.00 to 12.50
Scrap rails	15.00 to 15.50
New hvy. bndled sheets	12.00 to 12.50
Old hydraul. bundles.	10.50 to 11.00
Drop forge flashings..	12.00 to 12.50
No. 1 busheling	12.00 to 12.50
Hvy. axle turnings....	10.50 to 11.00
Machine shop turn....	6.75 to 7.25
Knuckles & couplers..	16.50 to 17.00
Coil & leaf springs....	16.50 to 17.00
Rolled steel wheels....	16.00 to 16.50
Low phos. billet crops.	15.50 to 16.00
Shov. turnings	6.75 to 7.25
Mixed bor. & turn....	6.75 to 7.25
Cast iron borings	6.50 to 7.00
Steel car axles	16.50 to 17.00
No. 1 machinery cast.	15.50 to 16.00
No. 1 cupola cast.	14.50 to 15.00
Stove plate	13.00 to 13.50
Steel rails under 3 ft..	17.50 to 18.00
Cast iron carwheels...	13.50 to 14.00
Railroad malleable	14.50 to 15.00
Chemical borings	8.50 to 9.00

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting	$12.50 to $13.00
No. 1 hvy. melting....	12.50 to 13.00
No. 2 hvy. melting....	12.00 to 12.50
No. 1 locomotive tires.	14.00 to 14.50
Misc. stand. sec. rails.	14.00 to 14.50
Railroad springs	15.00 to 15.50
Bundled sheets	8.00 to 8.50
No. 1 busheling	7.50 to 8.00
Cast. bor. & turn.....	4.25 to 4.75
Machine shop turn.....	5.00 to 5.50
Heavy turnings	9.00 to 9.50
Rails for rolling	16.50 to 17.00
Steel car axles	18.50 to 19.00
No. 1 RR. wrought....	10.75 to 11.25
No. 2 RR. wrought....	12.50 to 13.00
Steel rails under 3 ft..	15.50 to 16.00
Steel angle bars	15.00 to 15.50
Cast iron carwheels...	13.00 to 13.50
No. 1 machinery cast..	14.00 to 14.50
Railroad malleable	12.50 to 13.00
No. 1 railroad cast....	11.00 to 11.50
Stove plate	10.00 to 10.50
Grate bars	8.50 to 9.00
Brake shoes	10.00 to 10.50

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel	$11.25 to $11.75
No. 2 hvy. mltng. steel.	9.00 to 9.75
Scrap rails for mltng..	15.25 to 15.75
Loose sheet clippings.	6.75 to 7.25
Hydrau. b'ndled sheets	10.25 to 10.75
Cast iron borings	3.25 to 3.75
Machine shop turn....	3.75 to 4.25
No. 1 busheling	8.00 to 8.50
No. 2 busheling	2.75 to 3.25
Rails for rolling	17.25 to 17.75
No. 1 locomotive tires.	14.00 to 14.50
Short rails	17.75 to 18.25
Cast iron carwheels...	12.50 to 13.00
No. 1 machinery cast.	12.00 to 12.50
No. 1 railroad cast....	11.00 to 11.50
Burnt cast	7.00 to 7.50
Stove plate	7.00 to 7.50
Agricul. malleable	11.50 to 12.00
Railroad malleable	14.50 to 15.00
Mixed hvy. cast.	9.50 to 10.00

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel	$12.50 to $14.00
Scrap steel rails	14.50 to 15.00
Short shov. turnings..	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought....	.... 10.00
Rails for rolling	16.00 to 16.50
No. 1 cast	.... 14.50
Tramcar wheels	.... 14.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel	$10.00 to $10.50
No. 2 hvy. mltng. steel.	8.50 to 9.00
Borings and turnings.	6.00 to 6.50
Long turnings	6.00 to 6.50
Short shov. turnings..	7.00 to 7.50
No. 1 machinery cast..	11.50 to 12.00
Automotive cast	12.50 to 13.00
Hvy. breakable cast...	9.00 to 9.50
Hydraul comp. sheets.	12.00 to 12.50
Stove plate	8.00 to 8.50
New factory bushel...	11.00 to 11.50
Old No. 2 busheling..	3.00 to 3.50
Sheet clippings	8.50 to 9.00
Flashings	9.00 to 9.50
Low phos. plate scrap	11.50 to 12.00

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel	$10.00 to $10.50
No. 2 hvy. mltng. steel	8.50 to 9.00
Hvy. breakable cast...	11.50 to 12.00
No. 1 machinery cast.	12.00 to 12.50
No. 2 cast	9.50 to 10.00
Stove plate	9.00 to 9.50
Steel car axles	20.00 to 20.50
Shafting	15.00 to 15.50
No. 1 RR. wrought....	11.00 to 11.50
No. 1 wrought long....	9.50 to 10.00
Spec. iron & steel pipe	8.50 to 9.00
Rails for rolling	16.00 to 16.50
Clean steel turnings*	3.50 to 4.00
Cast borings*	3.00 to 3.50
No. 1 blast furnace...	3.00 to 3.50
Cast borings (chem.)..	9.50 to 10.00
Unprepared yard scrap	5.00 to 5.50
Light iron	3.00 to 3.50

Per gross ton, delivered local foundries:

No. 1 machn. cast†	$13.50 to $14.00
No. 2 cast†	10.50 to 11.00

* $1.50 less for truck loads.
† Northern N. J. prices are $2 to $2.50 higher.

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel	Nominal
Scrap rails	Nominal
No. 2 steel	Nominal
Breakable cast	$10.25 to $10.75
Machine shop turn....	$3.38 to 4.50
Mixed bor. & turn.....	2.00 to 2.25
Bun. skeleton long....	7.50 to 7.75
Shafting	14.00 to 14.50
Cast bor. chemical....	5.50 to 5.75

Per gross ton delivered consumers' yards:

Textile cast	$14.50 to $15.00
No. 1 machine cast....	14.00 to 14.50

PACIFIC COAST

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$12.50 to $13.00
No. 2 hvy. mltng. steel.	11.50 to 12.00

CANADA

Dealers' buying prices at their yards, per gross ton:

	Toronto	Montreal
No. 1 hvy. mltng. steel.	$9.50	$9.00
No. 2 hvy. mltng. steel.	8.00	7.50
Mixed dealers steel...	7.00	6.50
Scrap pipe	5.50	5.00
Steel turnings	4.50	4.00
Cast borings	3.50	3.00
Machinery cast	15.00	14.00
Dealers cast	13.00	12.00
Stove plate	11.00	10.50

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges

No. 1 hvy. mltng. steel	$11.00 to $11.50
No. 2 hvy. mltng. steel.	9.50 to 10.00
No. 2 cast	10.00 to 11.00
Stove plate	9.00 to 10.00

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mltng. steel	$12.50 to $13.00
No. 2 hvy. mltng. steel.	11.50 to 12.00
Rails (scrap)	12.50 to 13.00

Philadelphia, delivered alongside boats, Port Richmond

No. 1 hvy. mltng. steel	Nominal
No. 2 hvy. mltng. steel	Nominal

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are $2 higher. F.o.b. Duluth, billets only, $2 higher.

	Per Gross Ton
Rerolling	$34.00
Forging quality	40.00

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or bessemer	$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods

(No. 5 to 9/32 in.)

	Per Gross Ton
Pittsburgh, Chicago or Cleveland	$43.00
Worcester, Mass.	45.00
Birmingham	43.00
San Francisco	52.00

Rods over 9/32 in. or 47/64 in., inclusive, $5 a ton over base.

SOFT STEEL BARS

	Base per Lb.
Pittsburgh, Chicago, Gary, Cleveland, Buffalo and Birmingham	2.25c.
Detroit, delivered	2.35c.
Duluth	2.35c.
Philadelphia delivered	2.57c.
New York	2.59c.
On cars dock Gulf ports	2.60c.
On cars dock Pacific ports	2.85c.

RAIL STEEL BARS

(For merchant trade)

Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.10c.
On cars dock Tex. Gulf ports	2.45c.
On cars dock Pacific ports	2.70c.

BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Cleveland, Youngstown or Sparrows Pt.	1.90c. to 2.05c.
Detroit, delivered	2.00c. to 2.15c.
On cars dock Tex. Gulf ports	2.25c. to 2.40c.
On cars dock Pacific ports	2.50c.

RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh, Chicago, Gary, Buffalo, Cleveland, Youngstown or Birmingham	1.75c. to 1.90c.
Detroit, delivered	1.85c. to 2.00c.
On cars dock Tex. Gulf ports	2.10c. to 2.25c.
On cars dock Pacific ports	2.35c.

The above range in prices covers generally the spread between large and small jobs.

IRON BARS

Chicago and Terre Haute	2.15c.
Pittsburgh (refined)	3.60c.

COLD FINISHED BARS AND SHAFTING*

	Base per Lb.
Pittsburgh, Buffalo, Cleveland, Chicago and Gary	2.70c.
Detroit	2.75c.

* In quantities of 10,000 to 19,999 lb.

PLATES

	Base per Lb.
Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont, Del.	2.10c.
Philadelphia, del'd	2.15c.
New York, del'd	2.29c.
On cars dock Gulf ports	2.45c.
On cars dock Pacific ports	2.60c.
Wrought iron plates, P't'g	3.80c.

FLOOR PLATES

Pittsburgh or Chicago	3.35c.
New York, del'd	3.71c.
On cars dock Gulf ports	3.70c.
On cars dock Pacific ports	3.95c.

STRUCTURAL SHAPES

	Base per Lb.
Pittsburgh, Chicago, Gary, Buffalo, Bethlehem or Birmingham	2.10c
Philadelphia, del'd	2.215c.
New York, del'd	2.27c.
On cars dock Gulf ports	2.45c.
On cars dock Pacific ports	2.70c.

STEEL SHEET PILING

	Base per Lb.
Pittsburgh, Chicago or Buffalo	2.40c.
On cars dock Gulf ports	2.85c.
On cars dock Pacific ports	2.90c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$40.00
Angle bars, per 100 lb.	2.70

F.o.b. Basing Points

Light rails (from billets) per gross ton	$40.00
Light rails (from rail steel) per gross ton	39.00

	Base per Lb.
Cut spikes	3.00c.
Screw spikes	4.55c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast ports	2.25c.
Track bolts, to steam railroads	4.15c.
Track bolts, to jobbers, all sizes (per 100 counts)	(Not announced)

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS

PRICES F.O.B. UNLESS OTHERWISE NOTED

Hot Rolled

	Base per Lb.
Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown or Middletown	2.15c.
Detroit, delivered	2.25c.
Philadelphia, delivered	2.32c.
Granite City	2.25c.
On cars dock Pacific ports	2.65c.
Wrought iron, Pittsburgh	4.25c.

Cold Rolled*

Pittsburgh, Gary, Buffalo, Youngstown, Cleveland or Middletown	3.20c.
Detroit, delivered	3.30c.
Granite City	3.30c.
Philadelphia, delivered	3.52c.
On cars dock Pacific ports	3.80c.

* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.

Galvanized Sheets, 24 Gage

Pittsburgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown or Birmingham	3.50c.
Philadelphia, delv'd	3.67c.
Granite City	3.60c.
On cars dock Pacific ports	4.00c.
Wrought iron, Pittsburgh	6.10c.

Electrical Sheets

(*F.o.b. Pittsburgh*)

	Base per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Special Motor	4.95c.
Special Dynamo	5.65c.
Transformer	6.15c.
Transformer Special	7.15c.
Transformer Extra Special	7.65c.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extras plus 25c. per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

Long Ternes

No. 24 unassorted 8-lb. coating f.o.b. Pittsburgh or Gary	3.95c.
F.o.b. cars dock Pacific ports	4.65c.

Vitreous Enameling Stock, 20 Gage

Pittsburgh,, Gary Youngstown, Middletown or Cleveland	3.35c.
Detroit, delv'd	3.45c.
Granite City	3.45c.
On cars dock Pacific ports	3.95c.

TIN MILL PRODUCTS

Black Plate

Pittsburgh	3.15c.
Gary	3.15c.
Granite City	3.25c.
On cars dock Pacific ports, boxed	4.10c.

NOTE: No. 29 gage is heaviest in which tin mill black plate is sold. No. 28 and heavier taking sheet base. There are no gages which take the above base prices as extras are applicable in all cases.

Tin Plate

	Per Base Box
Standard cokes, Pittsburgh and Gary	$5.35
Standard cokes, Granite City	5.45

Special Coated Manufacturing Ternes

	Per Base Box
Pittsburgh	$4.65
Gary	4.65
Granite City	4.75

Roofing Terne Plate

(*F.o.b. Pittsburgh*)

(Per Package, 112 sheets, 20 x 28 in.)

8-lb. coating I.C.	$12.00
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.00
25-lb. coating I.C.	16.00
30-lb. coating I.C.	17.25
40-lb. coating I.C.	19.50

HOT ROLLED STRIP

Prices F.o.b. Unless Otherwise Noted

(*Widths up to 12 in.*)

	Base per Lb.
Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown or Birmingham	2.15c.
Detroit, delivered	2.25c.

Cooperage Stock

Pittsburgh & Chicago	2.25c.

COLD ROLLED STRIP*

	Base per Lb
Pittsburgh, Youngstown or Cleveland	2.95c.
Chicago	3.05c.
Detroit, delivered	3.05c.
Worcester	3.15c.

* Carbon 0.25 and less.

Commodity Cold Rolled Strip

Pittsburgh, Youngstown or Cleveland	3.10c.
Detroit, delivered	3.20c.
Worcester	3.50c.

COLD ROLLED SPRING STEEL

	Pittsburgh and Cleveland	Worcester
Carbon 0.26-0.50%	2.95c.	3.15c.
Carbon .51- .75	4.30c.	4.50c.
Carbon .76-1.00	6.15c.	6.35c.
Carbon 1.01 to 1.25	8.35c.	8.55c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh, Chicago, Cleveland and Birmingham)

To Manufacturing Trade

	Per Lb.
Bright wire	2.60c.
Galvanized wire, base	2.65c.*
Spring wire	3.20c.

*On galvanized wire to manufacturing trade, size and galvanizing extras are charged, the price Nos. 6 to 9 gage, inclusive, thus being 3.15c.

To the Trade

	Base per Keg
Standard wire nails	$2.45
Coated nails	2.45
Cut nails, carloads	3.60

	Base per 100 Lb.
Annealed fence wire	$2.95
Galvanized fence wire	3.35
Polished staples	3.15
Galvanized staples	3.40
Barbed wire, galvanized	3.20
Twisted barbless wire	3.20
Woven wire fence, base column.	67
Single loop bale ties, base col...	56

Note: Birmingham base same on above items, except spring wire.

Add $4 a ton for Mobile, Ala.; $5 for New Orleans; $6 for Lake Charles to above bases except on galvanized and annealed merchant fence wire, which are $1 a ton additional in each case.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel			*Wrought Iron*		
In.	Black	Galv.	In.	Black	Galv.
⅛	56	36	¼ & ⅜	+9	+30
¼ to ⅜	59	43½	½	24	6½
½	63½	54	¾	30	13
¾	66½	58	1 & 1¼	34	19
1 to 3	68½	60½	1½	38	21½
			2	37½	21

Lap Weld

2	61	52½	2	30½	15
2½ & 3	64	55½	2½ to 3½	31½	17½
3½ to 6	66	57½	4	33½	21
7 & 8	65	53½	4½ to 8.	32½	20
9 & 10	64½	55	9 to 12	28½	15
11 & 12	63½	54			

Butt Weld, extra strong, plain ends

⅛	54½	41½	¼ & ⅜	+10	+43
½ to ⅜	56½	45½	½	25	9
½	61½	53½	¾	31	15
¾	65½	57½	1 to 2	38	22½
1 to 3	67	60			

Lap Weld, extra strong, plain ends

2	59	51½	2	33½	18½
2½ & 3	63	55½	2½ to 4.	39	25½
3½ to 6	61½	59	4½ to 6.	37½	24
7 & 8	65½	56	7 & 8	38½	24½
9 & 10	64½	55	9 to 12	32	20½
11 & 12	63½	54			

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher, on all butt weld 3 in. and smaller.

Boiler Tubes

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall.

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Seamless Cold Drawn	Seamless Hot Rolled	Lap Weld Hot Rolled
1 in. o.d. 13 B.W.G.	$ 9.01	$ 7.82	....
1¼ in. o.d. 13 B.W.G.	10.67	9.26	....
1½ in. o.d. 13 B.W.G.	11.79	10.23	9.72
1¾ in. o.d. 13 B.W.G.	13.42	11.64	11.06
2 in. o.d. 13 B.W.G.	15.03	13.04	12.38
2¼ in. o.d. 13 B.W.G.	16.76	14.54	13.79
2¼ in. o.d. 12 B.W.G.	18.45	16.01	15.16
2½ in. o.d. 12 B.W.G.	20.21	17.54	16.58
2¾ in. o.d. 12 B.W.G.	21.42	18.59	17.54
3 in. o.d. 12 B.W.G.	22.48	19.50	18.35
3½ in. o.d. 11 B.W.G.	28.37	24.62	23.15
4 in. o.d. 10 B.W.G.	35.20	30.54	28.66
4½ in. o.d. 10 B.W.G.	43.04	37.35	35.22
5 in. o.d. 9 B.W.G.	54.01	46.87	44.25
6 in. o.d. 7 B.W.G.	82.93	71.96	68.14

Extras for less carload quantities:

40,000 lb. or ft. or over	Base
30,000 lb. or ft. to 39.999 lb. or ft.	5%
20,000 lb. or ft. to 29.999 lb. or ft.	10%
10,000 lb. or ft. to 19.999 lb. or ft.	20%
5,000 lb. or ft. to 9.999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

CAST IRON WATER PIPE

Per Net Ton

*6-in. and larger, del'd Chicago.	$51.00
6-in. and larger, del'd New York	49.00
*6-in. and larger, Birmingham.	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	52.00
F.o.b. dock, Seattle	52.00
4-in. f.o.b. dock, San Francisco or Los Angeles	55.00
F.o.b. dock, Seattle	52.00

Class "A" and gas pipe, $3 extra 4-in. pipe is $3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $42, Birmingham, and $50 delivered Chicago and 4-in. pipe, $45, Birmingham, and $54 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts: ½ in. & 6 in. and smaller.	65, 5 and 5*
Larger and longer up to 1 in.	60, 10 and 5*
1⅛ in. and larger	60, 5 and 5*
Lag bolts	60, 10 and 5
Plow bolts, Nos. 1, 2, 3 and 7	65, 5 and 5
Hot pressed nuts, and c.p.c. and t nuts, square or hex. blank or tapped: ½ in. and smaller	65 and 5
9/16 in. to 1 in. inclusive.	60, 5 and 5
1⅛ in. and larger	60 and 5

* Less carload lots and less than full container quantity. Less carloads lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-fin. hexagon nuts	U.S.S.	S.A.E.
1/14 to 7/16 in. incl.	65-10	70-5
½ to 9/16 in.	65-5	70
⅝ to 1-in. incl.	60-10	65
1⅛ in. and larger	60-5	60-5

Beyond the above, an additional 10 per cent allowed for full container quantities.

Stove bolts in packages, nuts attached	75
Stove bolts in packages, with nuts separate	75 and 12½
Stove bolts in bulk	85

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(½-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh, Cleveland Chicago, Birmingham $3.40

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham .... 65 and 10

Cap and Set Screws

(Freight allowed to destination)

Per Cent Off List

Milled hexagon head cap screws, 1 in. dia. and smaller	50 and 10
Milled square head set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread ¾ in. and smaller	70 and 10
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	67½ and 10
Upset set screws, cup and oval points	75 and 10
Milled studs	60½ and 10

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.

Base price, $56.00 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base	2.80c.
Delivered, Detroit	2.90c.

S.A.E. Series Numbers	Alloy Differential per 100 Lb.
2100 (1½% Nickel)	0.75
2300 (3½ Nickel)	1.55
2500 (5% nickel)	$2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.35
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel - molybdenum (0.20 to 0.30 Mo. 1.50 to 2.00 Ni)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel-vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.40c. base per lb. Delivered Detroit, 3.50c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip	23.50c.	21.50c.
Cold-rolled strip	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c.	22c.	25.50c.	30.50c.
Sheets	26.50c.	29c.	32.50c.	36.50c.
Hot strip	17c.	17.50c.	23c.	28c.
Cold stp.	22c.	22.50c.	28.50c.	36.50c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 5c. a lb. higher.

British and Continental

BRITISH

Per Gross Ton f.o.b. United Kingdom Ports

Ferromanganese, export	£14 Nominal
Tin plate, per base box	20s. 3d. to 21s. 6d.
Steel bars, open hearth	£11
Beams, open-hearth	£10 12s. 6d.
Channels, open-hearth	£10 17s. 6d.
Angles, open-hearth	£10 12s. 6d.
Black sheets, No. 24 gage	£13
Galvanized sheets, No. 24 gage	£16 15s.

CONTINENTAL

Per Gross Ton, Gold £, f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet bars	Nominal
Plate ¼ in. and up	£5 7s.
Plate 3/16 in. and 5 mm.	£5 13s.
Sheets ⅛ in.	£5 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£5 15s.

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	$21.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	21.00
Delivered Brooklyn	23.50
Delivered Newark or Jersey City	22.53
Delivered Philadelphia	21.84
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago and Youngstown*	20.00
F.o.b. Buffalo	20.00
F.o.b. Detroit	20.00
Southern, delivered Cincinnati	20.06
Northern, delivered, Cincinnati	20.44
F.o.b. Duluth	20.50
F.o.b. Provo, Utah	22.00
Delivered, San Francisco, Los Angeles or Seattle	26.95
F.o.b. Birmingham*	16.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	$21.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	20.50
F.o.b. Buffalo	19.00
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago and Youngstown	19.50
Delivered Philadelphia	21.34
Delivered Canton, Ohio	20.89
Delivered Mansfield, Ohio	21.44
F.o.b. Birmingham	15.00

Bessemer

F.o.b. Buffalo	$21.00
F.o.b. Everett, Mass.	22.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	22.00
Delivered Newark or Jersey City	23.53
Erie, Pa., and Duluth	21.00
F.o.b. Neville Island, Toledo, Chicago and Youngstown	20.50
F.o.b. Birmingham	21.00
Delivered Cincinnati	21.11
Delivered Canton, Ohio	21.89
Delivered Mansfield, Ohio	22.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	$25.50

Gray Forge

Valley or Pittsburgh furnace	$19.50

Charcoal

Lake Superior furnace	$25.00
Delivered Chicago	28.34

Canadian Pig Iron

Per Gross Ton

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload) $92.50

Spiegeleisen

Per Gross Ton Furnace

Domestic 19 to 21%	$28.00
Domestic, 26 to 28%	33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size

50% (carload lots, bulk)	$69.50*
50% (ton lots in 50 gal. bbl.)	80.50*
75% (carload lots, bulk)	126.00*
75% (ton lots in 50 gal. bbl.)	139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

Per Gross Ton

10.00 to 10.50% $29.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2%, $1 per ton additional. Phosphorus 0.75% or over, $1 per ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50% $23.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Ferrochrome

Per lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-manganese

Per Gross Ton, Delivered. Lump Size, Bulk, on Contract

3% carbon	$92.75
2.50% carbon	97.75
2% carbon	102.75
1% carbon	112.75

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads, nominally	$2.00
Ferrotungsten, lots of 500 lbs. nominally	2.05
Ferrotungsten, smaller lots, nominally	2.10
Ferrovanadium, contract, per lb. contained V., delivered	$2.70 to $2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots.	$2.25†
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	$142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	$157.50
Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, $3 unitage, freight equalized with Nashville	$75.00
Ferromolybdenum, per lb. Mo. f.o.b. furnace	95c.
Calcium molybdate, per lb. Mo. f.o.b. furnace	80c.

*Spot prices are $5 per ton higher
†Spot prices are 10c. per lb. of contained element higher

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	$5.25
Old range, non-Bessemer, 51.50%	5.10
Mesabi, Bessemer, 51.50%	5.10
Mesabi, non-Bessemer, 51.50%	4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal	17.00c.
Iron, low phos., Swedish, average, 68½% iron. Nominally	17 to 18c.
Iron, basic or foundry, Swedish, aver. 65% iron. Nominally	15c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	35c.
Man., African, Indian 44-48%	33c.
Man., African, Indian, 49-51%	35c.
Man., Brazilian, 46 to 48½%	33c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered	$20.00
Tungsten, domestic, scheelite delivered	$20.00 to 21.00
Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade)	15.00
Rhodesian, 45%	19.50
Rhodesian, 48%	23.00
Turkish, 48-49%	23.50 to 24.50
Turkish, 45-46%	22.50
Turkish, 44%	18.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50%	24.50 to 25.50
48-49%	24.50 to 25.00

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	$18.00
Domestic, f.o.b. Ohio River landing barges	18.00
No. 2 lump, 85-5, f.o.b. Kentucky and Ill. mines.	$18.00 to 19.00
Foreign, 85% calcium, fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	31.50

FUEL OIL

Per Gal.

No. 2 or diesel, f.o.b. Bayonne	4.00c.
No. 6, f.o.b. Bayonne	2.26c.
Del'd Chicago, No. 5 Bur. Stds.	3.25c.
Del'd Chicago, No. 6 Bur. Stds.	2.75c.
Del'd Cleve'd, No. 3 distillate	5.50c.
Del'd Cleve'd, No. 4 industrial	5.00c.
Del'd Cleve'd, No. 5 industrial	3.25c.
Del'd Cleve'd, No. 6 industrial	3.00c.

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, Prompt	$3.75
Foundry, f.o.b. Connellsville, Prompt	$4.75 to 5.50
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by-product, Philadelphia	10.95
Foundry, by-product, delivered Cleveland	10.30
Foundry, by-product, delivered Cincinnati	9.75
Foundry, Birmingham	7.50
Foundry, by-product, del'd St. Louis industrial district	10.75 to 11.00
Foundry, from Birmingham, f.o.b. cars dock, Pacific ports	14.75

. . .NON-FERROUS. . .

. . . Higher foreign prices and better domestic demand bring rises in copper, lead and zinc quotations . . . Fourth quarter tin quotas unchanged . . . Foreign and domestic copper stocks decline in August; shipments higher.

NEW YORK, Sept. 20.—The non-ferrous markets in the past week were featured by two advances in lead, zinc and copper quotations and heavy, well-diversified demand. A large portion of the domestic betterment can be traced to the stronger foreign markets where heavy armament purchases and general restocking against the possibilities of a conflict have raised prices there to new recent highs. Domestic copper bookings in the week amounted to about 37,000 tons, bringing the total for the month through Saturday to 44,240 tons. Two advances of ⅛c. each have brought producers' prices up to 10.375c. per lb., Connecticut Valley, for electrolytic metal. Fabricators' price lists have been revised to conform with these increases. Sales by the cartel group have been in fairly heavy volume all week at prices that worked up to 10.60c. per lb., c.i.f., usual ports, this morning. The foreign price of a week ago was 10.23c. per lb. The August statistics showed a further decrease in both foreign and domestic stocks, the former declining from 183,226 to 179,333 tons, and the latter from 339,970 to 315,191 tons. Shipments continued to gain, the domestic total for the month being 62,832 tons and the foreign 114,748, as compared with 54,597 and 113,185 in September.

The Week's Prices. Cents Per Pound for Early Delivery

	Sept. 14	Sept. 15	Sept. 16	Sept. 17	Sept. 19	Sept. 20
Electrolytic copper, Conn.*	10.25	10.25	10.25	10.25	10.375	10.375
Lake copper,, N. Y.	10.375	10.375	10.375	10.375	10.50	10.50
Straits tin, spot, New York	42.85	43.65	43.45	....	43.65	43.70
Zinc, East St. Louis	4.75	4.85	4.85	4.85	4.95	4.95
Zinc, New York	5.14	5.24	5.24	5.24	5.34	5.34
Lead, St. Louis	4.75	4.85	4.85	4.85	4.95	4.95
Lead, New York	4.90	5.00	5.00	5.00	5.10	5.10

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
Aluminum, virgin, 99 per cent plus 20.00c.-21.00c. a lb., delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 14.00c. a lb., prompt, f.o.b., New York.
Antimony, American, 11.25c. per lb., prompt shipment, New York.
Quicksilver, $76.00 to $78.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 11.00c. a lb., less carload, delivered in Middle West
¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	44.00c. to 45.00c.
Tin, bar	46.00c. to 47.00c.
Copper, Lake	12.00c. to 12.50c.
Copper, electrolytic	11.25c. to 12.25c.
Copper, castings	10.75c. to 12.75c.
*Copper sheets, hot-rolled	18.375c.
*High brass sheets	16.75c.
*Seamless brass tubes	19.50c.
*Seamless copper tubes	18.875c.
*Brass rod	12.625c.
Zinc, slabs	6.25c. to 7.25c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.50c.
Lead, American pig	5.50c. to 6.50c.
Lead, bar	6.25c. to 6.625c.
Lead, sheets, cut	7.75c.
Antimony, Asiatic	15.00c. to 16.00c.
Alum., virgin, 99 per cent plus	22.50c. to 24.00c.
Alum., No. 1 for remelting, 98 to 99 per cent	19.50c. to 21.00c.
Solder, ½ and ½	29.25c. to 30.25c.
Babbitt metal, commercial grade	20.25c. to 50.25c.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33 1/3; on brass sheets and rods, 40, and on brass and copper tubes, 25.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits, pig	47.75c.
Tin, bar	49.75c.
Copper, Lake	11.375c. to 11.625c.
Copper, electrolytic	11.375c. to 11.625c.
Copper, castings	11.175c.
Zinc, slabs	7.50c. to 7.75c.
Lead, American pig	5.60c. to 5.85c.
Lead, bar	8.75c.
Antimony, Asiatic	17.75c. to 18.00c.
Babbitt metal, medium grade	21.25c.
Babbitt metal, high grade	51.75c.
Solder, ½ and ½	28.50c.

Old Metals Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	8.25c.	9.00c.
Copper, hvy. and wire	7.25c.	7.75c.
Copper, light and bottoms	6.50c.	6.75c.
Brass, heavy	4.375c.	4.875c.
Brass, light	3.375c.	4.125c.
Hvy. machine composition	6.875c.	8.375c.
No. 1 yel. brass turnings	4.25c.	4.75c.
No. 1 red brass or compos. turnings	6.375c.	6.875c.
Lead, heavy	3.50c.	3.875c.
Cast aluminum	7.00c.	8.25c.
Sheet aluminum	11.25c.	12.75c.
Zinc	2.125c.	3.375c.

Tin

The possibility of a European conflict adversely affecting the availability of tin supplies brought out a good quantity of futures inquiry last week, in fact more than sellers were willing to cover. Nearby interest is not as great, but the week's business in this classification was heaviest in some time. This morning's quotation on Straits metal of 43.70c. per lb., New York represents a gain of 0.95c. over the price of a week ago. The London price has been moving up somewhat faster, this morning's price of cash standards being £195 15s., a gain of £3 5s. over the price prevailing a week ago. The tin cartel has reestablished present production quotas for the fourth quarter.

Zinc

Quotations on prime Western spelter were raised $2 a ton on Wednesday and yesterday (Monday) establishing the current price at 5.35c. per lb., New York. The increases in both instances were preceded by a good volume of buying, mostly for delivery in October and beyond. The week's sales totaled 15,554 tons of prime Western metal against 4618 in the preceding week, and shipments were 4455 tons against 3393 tons. Prices abroad have been moving slowly upward in an active market. On first call in London this morning, spot metal was quoted at 3.10c. per lb., as compared with 3c. a week ago.

Lead

The week's sales were in excess of 14,000 tons, the highest of any week this year, and was accompanied by two price increases which brought quotations up to 5.10c. per lb., New York. The buying was well spread among the various consuming industries and about two-thirds of the week's total called for October delivery. Business on the London exchange has been fairly heavy all week and prices have advanced to 3.45c. per lb., this morning's level, as compared with 3.30c. a week ago.

Industry Speaks . . .

A. W. ROBERTSON, chairman, Westinghouse Electric & Mfg. Co.—"Profits are so small, as a rule, that I am surprised the stockholders do not form a union to demand a greater return. Perhaps they need only a John L. Lewis to arouse them. In any case, a lucrative reward awaits some enterprising person as president of the International Stockholders Protective Union."

C. L. McCUEN, Oldsmobile division president, General Motors Corp.—Dealers are in good condition, with new-car and used-car stocks well cleaned up. We feel that we will have an increase of from 25 to 30 per cent in business this year over last.

CARLE C. CONWAY, chairman, Continental Can Co.—"Sometimes I think we depend too much upon the written words of our economic experts. Many of them decry the collapse of private financing and predict dire consequences from increased Government spending and debt. Yet they seldom if ever tell that private financing, as it existed in the twenties, has practically ceased to exist all over the world, in comparable amount or quality."

Industry Listens . . .

"No one in his right mind would sanction homeless hunger or nakedness in this land of plenty, no matter what the cost. But we can get more relief for less money by restoring state responsibility and home rule and by purging those who play politics with human misery."—SENATOR ARTHUR VANDENBURG.

"Our Committee intends to be helpful, not hostile to business."—SENATOR JOSEPH O'MAHONEY, chairman, Anti-Monopoly Investigating Committee.

"The iron and steel industry as a whole cannot cover expenses while operating at only about 40 per cent of capacity."—LEONARD P. AYRES, vice-president, Cleveland Trust Co.

Steel Wage Ruling Faces Further Delay

CHAIRMAN HOLLAND of the Public Contracts Board said on Tuesday at Washington that the recommendations for establishing minimum wages in the steel industry will not be handed down this week and that there is a possibility they may not be ready next week. He declined to discuss the reasons for the continued delay.

Drive for Munitions Sales Abroad Seen at Washington

WASHINGTON. — With the tense European situation dominating the news, Washington observers are speculating on the possibility of revising the neutrality laws, under which munitions shipments to warring countries are prohibited, and the Johnson Act, which bans loans to defaulted nations.

Congress will be put under immediate pressure upon convening to amend the Neutrality Act to permit shipments of munitions to take care of a greatly enlarged market for all manufactured goods, machines and other essentials. And it is generally believed that the Administration would oppose drastic tightening of the act to shut off all shipments—a step which inevitably would lead to a glut in farm produce, reduced industrial output and resultant commodity price drop.

If public opinion has crystallized by the time Congress convenes, and sentiment grows in favor of the democracies in Europe, the difficulties in the way of revising the Neutrality Act are not believed to be large.

After revision, the long-term result would be highly stimulating to industry despite the Johnson Act. The opinion prevails that some means of getting around this prohibition of loans to defaulting countries will be found by some method of financing sales if public opinion so decrees. Prior to that time, transactions probably would be done on a cash and carry basis.

Even if the neutrality laws are invoked, cutting off munition shipments to belligerents, the foreign country has access to American goods if the ships owned by the foreign power are used for shipment.

"Sell Yourself to The Public," Girdler Tells Industry

CLEVELAND.—National policies which fail to promote greater production of goods, more work for those who want to work, and increased confidence on the part of capital, cannot be called constructive, T. M. Girdler, chairman, Republic Steel Corp., said in an address for delivery before the 16th annual conference of the National Industrial Advertisers Association, Inc., here, Wednesday, Sept. 21.

"During the last few years the left wing critics of business have fed to the people of this country an amazing and continuous diet of misinformation and misrepresentation," said Mr. Girdler. "Are we going to sit back and let the public absorb this diet without making any concerted effort to bring out the truth? Do you think anything is going to be accomplished by business if we simply sulk in our offices, without getting out on the road and presenting our side of the picture to the public?

"We must freely admit that under modern conditions certain reasonable government regulations may be in the public interest," he said. "And those that are in the public interest should be welcomed. But if private enterprise is to function, these regulations must stop short of drastic controls which make profitable operation impossible and, actually or in effect, destroy private industry."

Fight Regimentation, A. W. Robertson Says

WASHINGTON.—Warning that misunderstandings regarding policies and achievements of private enterprise were bound to arise in a "Kilowatt Hour Age" as contrasted to a "horse-power civilization," A. W. Robertson, chairman of the Westinghouse Electric & Mfg. Co., Pittsburgh, urged business "to stand by its colors" in guarding against regimentation.

Speaking on Monday at the second general session of the Seventh International Management Congress, which is being attended here this week by business leaders and executives from leading countries throughout the world, Mr. Robertson ascribed failure to recognize private enterprise as "the mainspring of all our activities" to the fact that "we cannot see the propellers of our civilization."

Pig Iron Price Lifted $1 a Ton

CLEVELAND.—Interlake Iron Co. announces effective Tuesday, Sept. 27, on fourth quarter pig iron business an advance of $1 per ton at Duluth, Chicago, Toledo and Erie.

THIS WEEK'S MACHINE . . .TOOL ACTIVITIES. . .

. . . September order volume will probably show an increase, with foreign business predominating . . . Small tool and cutter sales continue their upward trend.

Mid-West Plants Set to Buy When Conditions Stabilize

CHICAGO—The most optimistic note that can be struck in this district is the fact that a substantial number of machine tools have been discussed and quoted, and are ready to be bought when business improves; therefore the first sign of a definite upturn is almost sure to result in a moderate buying spurt. Buyers in many cases know what they want and have made what amounts to promises that the go-ahead signal will be given when steady betterment of conditions is indicated. September thus far is showing more small tool orders than August, which ran 20 per cent ahead of July. Those tool building plants in this district that are operating well are able to do so almost entirely because of foreign or Federal work. Business from England, Russia, Japan and Switzerland has been placed here recently. One builder states the disk grinders and abrasive department of his plant are running five days a week, whereas the machine tool division averages two to three days weekly.

Resumption of Auto Output Helps Small Tool Sales

DETROIT—Major programs in the automobile industry are still in the tentative stage, but production is being rapidly resumed in automobile plants, thereby increasing the demand for perishable tools. Last-minute delivery and installation of production equipment for 1939 is another current activity.

Cleveland Builders Report Better September Volume

CLEVELAND—September bookings of manufacturers in this area are running ahead of those of August, with foreign business predominant. The domestic scene is definitely a little stronger. In this vicinity during the past 10 days a number of sales of single tools have been made, including several lathes to a pump manufacturer, a planer to a tool builder, and several grinders to a precision tool manufacturer. It is understood a number of tools may be required soon for the Nela Park plant of General Electric Co. Press manufacturers report fair activity at Detroit during the last two weeks, more inquiries in northern Ohio and that small presses are moving well, the latter considered an encouraging sign since demand for this type of equipment is from small shops, some of which are receiving business "farmed out." At Youngstown a considerable share of the steel mill equipment orders recently received by United Engineering & Foundry Co. will be machined.

Uncertainties Slow Up Buying Activity in the East

NEW YORK—New business thus far this month is barely equaling the August average, while inquiries are definitely lower. Light tools and attachments are relatively more active at present than the heavier items. The uncertainty caused by the situation abroad, together with the failure of domestic industrial activity to improve as had been expected after Labor Day, has caused many buyers to hold up action on pending purchases. This development has served to inject a tinge of pessimism into the sentiments of local dealers, as the amount of business involved in this manner is substantial. The preparation of specifications covering the equipment to be purchased by the Brooklyn Navy Yard is progressing very slowly and it is not likely that sellers will be able to figure on this work before the first of the year.

The Lamp Division of the Hygrade Sylvania Corp. at Salem, Mass., has just placed orders for new machinery at an approximate cost of $50,000. Orders previously placed by the Hygrade Sylvania Corp. this year for new machinery amounted to more than $100,000.

Cincinnati Finds Domestic Orders Are Creeping Up

CINCINNATI—Demand swung upward in the local machinery market the past week to about the level of two weeks ago. This was about the trade's expectancy since the market has shown an alternate weekly dip and rise for the past several months. Domestic ordering, however, shows further signs of revival, the current bookings from home sources being slightly ahead of previous levels. This steady rise has been a definitely bright spot in the district and lends a substantial basis to manufacturers' hopes.

New Gas Line to Mesaba Would Require 150,000 Tons of Pipe

KANSAS PIPE LINE & GAS CO., Norton, Kan., has filed an application with the Federal Power Commission for authority to construct natural gas pipe lines from the Hugoton gas field in southwestern Kansas to the Mesaba iron range in Minnesota together with intervening tap lines involving about 150,000 net tons of pipe. The main line will be 1040 miles long and the tap lines will consist of 1306 miles.

The ultimate original cost of the project is estimated at $21,470,000 but the application indicates that the company proposes certain savings. One proposal contemplates the substitution of 16-in. pipe with a weight of 55.23 lb. per lin. ft. instead of 16-in. pipe with a weight of 62.58 lb. per lin. ft. as originally planned. This change would save $931,000, it is estimated. It would also reduce the main line requirements to 87,484.3 net tons, from 99,626.7 net tons.

The company has applied to the Reconstruction Finance Corp. for a loan of $20,000,000 to finance the project. A total of 129 cities, towns and villages in the five states, having a combined population of 370,000, would be served through the proposed facilities and the company would make available natural gas for processing low grade iron ore in both the Cuyuna and Mesaba regions. This would be done through the sale of gas to plants which would process ores which now, the application says, cannot be worked because of the lack of low priced fuel.

Meanwhile, the National Bituminous Coal Commission, acting under provisions of the coal act authorizing it "to take whatever action it deems necessary and proper to promote the use of coal," has petitioned the Federal Power Commission for permission to intervene in the Kansas Pipe Line & Gas Co. project.

Estimated Cost of Pipe Lines

*Main Line	Weight per Lineal Ft.	Miles	Cost per Mile	Total
16 in.	62.58	600	$16,070	$9,640,200
12¾ in.	41.51	36	11,230	404,280
10¾ in.	28.04	140	7,880	1,103,200
8⅝ in.	18.26	264	5,790	1,528,000
		1040		$13,675,680
Tap Lines				
8⅝ in.	18.26	40	$5,790	$231,600
6⅝ in.	12.89	220	4,280	941,160
4½ in.	8.64	345	2,940	1,014,300
3½ in.	5.29	255	2,150	548,250
2 in. (I.D.)	3.65	446	1,670	744,820
		1306		$3,480,130

*All sizes are o.d., except last item which is i.d.

FABRICATED STEEL

. . . Awards jump to 66,590 tons from 17,300 tons last week . . . New projects remain at low level of 13,715 tons, against 12,240 tons a week ago . . . Plate awards at 1555 tons.

NORTH ATLANTIC STATES
AWARDS

50,000 Tons, New York, housing project for Metropolitan Life Insurance Co. in the Bronx, to Bethlehem Steel Co., Bethlehem, Pa. This award cancels most of the 15,000 tons of reinforcing bars for the same project, recently awarded to Bethlehem, the building design having been changed.

7000 Tons, Queens, N. Y., elevated highway 45th-64th Streets, to Bethlehem Steel Co., Bethlehem, Pa.

375 Tons, Malden, Mass., high school addition to New England Structural Co., Everett, Mass., Rugo Construction Co., Inc., contractor.

500 Tons, Brooklyn, N. Y., superstructures, Red Hook housing project, to Bethlehem Steel Co., Bethlehem, Pa., through George A. Fuller Co., New York.

310 Tons, Tioga County, N. Y., highway bridge, to Lackawanna Steel Construction Co., Lane Constructing Co., general contractor.

230 Tons, Pittsburgh, Schiller school, to Pittsburgh Bridge & Iron Works, Pittsburgh.

215 Tons, Ford City, Pa., Crooked Creek dam, to Fort Pitt Bridge Works Co., Canonsburg, Pa.

190 Tons, Mattawamkeag, Me., power house extension for Great Northern Paper Co., to Megquier & Jones.

180 Tons, Cumberland County, Pa., highway bridge, to Bethlehem Steel Co., Bethlehem, Pa.

175 Tons, Ellenburg, N. Y., central school, to Bethlehem Contracting Co., Bethlehem, Pa., Andrew Weston, general contractor.

130 Tons, Philadelphia, highway bridge over Reading Railroad, to Bethlehem Steel Co.

126 Tons, Danbury, Conn., addition to hospital, to Standard Structural Steel Co., Hartford, Conn., M. A. Connor Co., general contractor.

100 Tons, Cranston, R. I., bridge, to American Bridge Co.

100 Tons, Boston, Neponset River bridge repairs, to Grossier & Slager Co., Somerville, Mass.

100 Tons, Mt. Kisco, N. Y., sewage plant, to Lord & Burnham.

100 Tons, New York, N. Y., Church of the Epiphany, 74th Street, York Avenue, to Bethlehem Fabricators, Bethlehem, Pa.

THE SOUTH

740 Tons, Chickamauga, Tenn., powerhouse for TVA, to Stupp Brothers Bridge & Iron Co.

500 Tons, Miami, Fla., bridge, to Nashville Bridge Co., T. A. Leving Co., general contractor.

150 Tons, Austin, Texas, 17 transmission towers, for Lower Colorado River authority, to Muskogee Iron Works.

128 Tons, Leake County, Miss., highway material, to Stupp Brothers Bridge & Iron Co., J. E. Meador & Co., general contractor.

CENTRAL STATES

854 Tons, Cedar Rapids, Ia., 8th Avenue bridge, to American Bridge Co., Koss Construction Co., general contractor.

670 Tons, Wahjamega, Mich., State hospital, to Whitehead & Kales, A. W. Kutsche Co., general contractor.

425 Tons, Keosauqua, Iowa, state bridge over Des Moines River, to Clinton Bridge Co., Clinton, Iowa.

105 Tons, Oconto County, Wis., bridge 3718, to Worden-Allen Co.

100 Tons, Chippewa County, Wis., bridge, to Worden-Allen Co.

WESTERN STATES

1045 Tons, Oakland, Cal., High Street county bridge, to Moore Drydock Co., Oakland, MacDonald & Kahn, San Francisco, general contractors.

575 Tons, San Diego, Cal., Naval Base storage building, to Minneapolis-Moline Power Implement Co., Minneapolis.

330 Tons, Oakland, Cal., railway inspection buildings, to Independent Iron Works, Oakland, Cal., Fred J. Early, San Francisco, general contractor.

300 Tons, San Francisco, auditorium for World's Fair, to Herrick Iron Works, Oakland, Cal.

203 Tons, Greenville, Cal., overpass and bridge, to Bethlehem Steel Co., San Francisco, George Pollock & Co., Sacramento, Cal., general contractor.

135 Tons, Vernon, Cal., factory for American Smelting & Refining Co., to Bethlehem Steel Co., Los Angeles.

NEW STRUCTURAL STEEL PROJECTS
NORTH ATLANTIC STATES

2200 Tons, Philadelphia, Navy Yard alterations and additions covering heavy machine and store house, machine shop extension and structural assembly shop.

900 Tons, Providence, R. I., parcel post building.

650 Tons, Brooklyn, N. Y., extension, crane runway, Navy Yard.

400 Tons, Pittsburgh, reconstruction, Herr's Island bridge.

325 Tons, Cambridge, Mass., municipal garage.

300 Tons, Coatesville, Pa., high school, bids Sept. 29.

210 Tons, Portsmouth, N. H., extension, machine shop building No. 80 for U. S. Navy.

205 Tons, Little Falls, N. Y., Hansen Avenue bridge.

200 Tons, Mt. Bevans, Mass., garage for U. S. Government.

200 Tons, Philadelphia, North East parochial high school.

200 Tons, Springfield, Mass., trade school.

190 Tons, North Branch, Md., state bridge over Patapsco River.

175 Tons, Brooklyn, building for New York Telephone Co.

175 Tons, Jamaica, N. Y., registrars building for U. S. Treasury Department.

150 Tons, Portsmouth, N. H., extension to electric manufacturing buildings for U. S. Government.

125 Tons, New York, World's Fair exhibit building for Swift & Co.

125 Tons, New York, addition to Aquinos Hall for Catholic Diocese of New York.

125 Tons, Pearl River, N. Y., laboratory building for American Cyanamid Co.

THE SOUTH

460 Tons, Charleston, S. C., extension machine and structural shops, Navy Yard, for U. S. Government.

CENTRAL STATES

1400 Tons, Cleveland, west approach Main Street bridge, Sam Emerson & Co., low bidder.

900 Tons, Minneapolis power house and water softener, bids Sept. 26.

500 Tons, Milwaukee bridge, bids Oct. 4.

400 Tons, Fairfield, Ohio, state highway bridge.

350 Tons, Columbus, Ohio, Olentangy River bridge for Franklin County.

350 Tons, Chicago, factory building for Clorox Chemical Co.

300 Tons, Chicago, office building for Pullman Standard Car Co.

205 Tons, York, Neb., state subway.

200 Tons, Duluth, Minn., state bridge No. 5593.

155 Tons, Milwaukee, South 70th St. bridge for city.

109 Tons, Bascom, Ohio, joists for consolidated high and grade school, bids are in.

WESTERN STATES

719 Tons, Bremerton, Wash., fabricated steel for supply officer (PWA 154), bids opened.

350 Tons, McChord Field, Wash., warehouse buildings, Allen & Early, Tacoma, general contractors.

195 Tons, Sacramento, Cal., Sutter Slough Bridge; bids Oct. 3. If alternate bid chosen, tonnage is reduced to 163.

165 Tons, Fort Sumner, N. M., underpass; bids opened.

101 Tons, Blackhawk, Colo., highway work; bids Sept. 23.

FABRICATED PLATES
AWARDS

720 Tons, Sewaren, N. J., 13 tanks, Shell Union Oil Corp. to Hammond Iron Works, Warren, Pa.

475 Tons, Philadelphia, 11,000 ft. 24-in. welded pipe to American Rolling Mill Co., Pittsburgh.

235 Tons, Brookline, Mass., Water Board, 1,000,000 gal. standpipe to Chicago Bridge & Iron Works, Chicago.

125 Tons, Philadelphia, 4 tanks, Barrett Co., to Graver Tank & Boiler Works.

PROJECTS

7680 Tons (revised tonnage), Los Angeles, Palos Verdes feeder of Colorado River aqueduct (Specifications 283); bids Oct. 4. If lock-joint steel cylinder pre-cast concrete pipe alternate is chosen, 2160 tons of sheets and plates.

1000 Tons, Sandusky, Ohio, 42-in. water intake line, new bids Sept. 28.

SHEET PILING
AWARDS

600 Tons, Detroit, Shell Oil Co. dock, to Bethlehem Steel Co., through American Construction Co.

400 Tons, Oakland, Cal., High Street county bridge, to Columbia Steel Co., San Francisco, MacDonald & Kahn, San Francisco, general contractors.

150 Tons, Oswego, N. Y., Huron Portland Cement Co. dock, to Bethlehem Steel Co., through American Construction Co.

PROJECTS

350 Tons, Wayne Township, Pickaway County, Ohio, H-piling for concrete bridges over Scioto River, for State of Ohio, bids Sept. 23.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With today's ever-increasing practice of making fewer passes and deeper drafts, steel mill lubricants must more than ever have a great margin of safety to protect against shock loads. Penola Extreme Pressure Lubricants have that safety margin—they withstand 3 to 5 times the pressures that cause ordinary lubricants to fail. That is why Penola lubricates over 85% of all 4-high mills and sells more steel mill lubricants than any other maker in the world.
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PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

Wilson Welder & Metals Co., Inc., 60 East Forty-second Street, New York, has let general contract to Consolidated Engineering Co., 20 East Franklin Street, Baltimore, for new one-story plant, 100 x 400 ft., in Sparrows Point district, Baltimore. Cost close to $100,000 with equipment.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until Sept. 28 for one motor-generator set (Circular 45); until Oct. 3, 200 dynamotor units (Circular 39).

Rosson, Inc., New York, custom-made automobile bodies, has leased space in building at 311 West Sixty-sixth Street for plant.

Edward F. Caldwell & Co., 38 West Fifteenth Street, New York, manufacturers of electric and gas lighting fixtures, etc., have leased 34,000 sq. ft. in Mono-Service industrial building, Verona Avenue and Oraton Street, Newark, N. J., for plant. Present works will be removed to new location.

Quartermaster Supply Office, Brooklyn, asks bids until Oct. 10 for one lathe, electric-operated bench grinder, bench drill press, two 12-in. lathes, one 4-in. jointer (Circular 57).

Frankfort Distilleries, Inc., 60 East Forty-second Street, New York, has let general contract to Cummins Construction Corp., 803 Cathedral Street, Baltimore, for 10-story addition to branch plant at Dundalk, Baltimore, 145 x 170 ft., for storage and distribution. Cost over $200,000 with equipment.

Handi Metal Stamping Corp., 175 Green Street, New York, has leased floors in building at 204 Green Street for increased capacity and will remove present works to new location.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 30 for 1300 extracting packing tools (Schedule 4385) for Brooklyn Navy Yard; six electric arc welding sets (Schedule 4397) for Brooklyn and Portsmouth yards.

Department of Sanitation, Municipal Building, New York, plans two-story motor truck service, repair and garage building, 210 x 300 ft., at 922-46 St. George Avenue, Brooklyn, for department trucks and motorized equipment. Cost about $250,000 with equipment. Warden H. Fenton, 101 Park Avenue, New York, is architect.

Board of Education, City Hall, Watertown, N. Y., plans manual training department in new three-story senior high school. Cost about $1,100,000. Financing has been arranged through Federal aid. C. W. Clark, 27 North Main Street, Cortland, N. Y., is architect; Lansing, Greene & Bisnette, Trust Co. Building, Watertown, are associate architects.

United States Engineer Office, New York District, Army Building, New York, asks bids until Sept. 28 for design and construction of one portable, steel building for storehouse at Government reservation, Federal lock and dam, Troy, N. Y.

Irvington Smelting & Refining Works, 374 Nye Avenue, Irvington, N. J., has let general contract to H. Montague & Son, Inc., 880 Bergen Avenue, Jersey City, N. J., for two-story addition. Cost over $40,000 with equipment. Epple & Kahrs, 15 Washington Street, Newark, are architects and engineers.

Commanding Officer, Ordnance Department, Picatinny Arsenal, near Dover, N. J., asks bids until Oct. 3 for reworking 20,000 lb. of brass turnings (Circular 200); until Oct. 7, 1020 fin assemblies, aluminum fabrications, for demolition bombs (Circular 209).

Shell-Union Oil Corp., 50 West Fiftieth Street, New York, has approved plans for expansion and improvements at bulk oil terminal at Sewaren, N. J., including eight steel tanks, capacities from 20,000 to 80,000 bbl. each. Cost close to $100,000.

Supply Officer, Naval Aircraft Factory, Philadelphia, asks bids until Sept. 27 for parts for airplanes, including aileron tube assemblies, aileron tube assembly rollers, etc. (Req. 573-Aero).

Scott Paper Co., Chester, Pa., tissue paper stocks, has let general contract to Wark & Co., 1608 Walnut Street, Philadelphia, for addition for expansion in machine department, intallation to include new paper-making machine and auxiliary equipment. This is part of a $3,000,000 expansion project to be carried out at plant. Stone & Webster Engineering Corp., 49 Federal Street, Boston, is consulting engineer.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until Sept. 26 for one spur and spiral bevel gear-burring machine, motor-driven (Circular 219), one 200-ton vertical-type single-action hydraulic press (Circular 229), four electric hoists (Circular 218).

NEW ENGLAND

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 30 for one 12-in. straight bevel gear generator (Schedule 3490), five 2000-lb. trolley type pneumatic hoists (Schedule 4396), one engraving machine (Schedule 4393), one light-duty radial drill (Schedule 4395), two combination contour metal sawing, filing and polishing machines (Schedule 4394), one horizontal boring, drilling and milling machine (Schedule 4391) for Portsmouth Navy Yard; one floor-type horizontal milling, drilling and boring machine (Schedule 4398) for Boston yard; all machines to be motor driven.

Raybestos-Manhattan, Inc., Bostwick Avenue, Bridgeport, Conn., brake lining, mechanical rubber goods, etc., has let general contract to O. F. Burghart, 333 North Avenue, for three one-story and one two-story additions to branch plant at Stratford, Conn., three of units for storage, distribution and generating operating service. Cost close to $90,000 with equipment.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until Oct. 3 for three hand milling machines, equipped with four arbors, and for three shell end mills and two arbors (Circular 46), four 6 x 18 in. surface grinders, with motor-driven and hydraulic table traverse (Circular 50), one horizontal hydraulic broaching machine, with puller and support (Circular 53).

Commanding Officer, Ordnance Department, Watertown Arsenal, Watertown, Mass., asks bids until Oct. 3 for one nibbling machine (Circular 103), one automatic shape-cutting machine (Circular 104).

WASHINGTON DIST.

Constructing Quartermaster, Holabird Quartermaster Depot, Baltimore, asks bids until Sept. 26 for one gasoline engine-driven centrifugal pump (Circular 17).

Coca-Cola Bottling Co. of Baltimore, Inc., 12 South Front Street, Baltimore, has let general contract to Cummins Construction Corp., 803 Cathedral Street, for two-story mechanical-bottling plant at Kirk Street and Exeter Hall Avenue, with storage and distributing facilities. Cost over $65,000 with equipment. Jesse M. Shelton, Bona Allen Building, Atlanta, Ga., is architect and engineer.

General Purchasing Officer, Panama Canal, Washington, asks bids until Sept. 30 for one 3-ton chain hoist, six ½-ton chain hoists, 60 tackle blocks, two 2000-lb. platform type weighing scales, galvanized steel wire rope, cast steel and plow steel wire rope, 7500 wire rope clips, 6000 ft. of rigid steel conduit, 4000 ft. of bare copper wire, 110,000 ft. of copper wire, 6500 ft. of electric cable, 7500 ft. of copper cord, 48,000 lb. of steel wire nails, 7000 lb. of wire finishing nails, brass pipe, copper pipe and other equipment (Schedule 3384).

Bureau of Yards and Docks, Navy Department, Washington, asks bids (no closing date stated) for sectional steel gate for shipbuilding ways at Norfolk Navy Yard, Va. (Specifications 8860).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 27 for water gage glasses (Schedule 4326); until Sept. 30, seamless steel tubing (Schedule 4389); until Oct. 4, steel oilers (Schedule 4383) for Eastern and Western Navy Yards; until Sept. 30, double end mill chucks (Schedule 4388) for Washington yard; two marine diesel engines and spare parts (Schedule 4386) for Philadelphia yard; three metal boats and three sets of machinery installations (Schedule 4439).

BUFFALO DISTRICT

Modern Heat Treating & Forging Co., 4 Lakeview Avenue, Buffalo, plans new one-story plant on Gull Street. Cost over $40,000 with equipment. Work is scheduled to begin this fall.

Central New York Power Corp., Ithaca, N. Y., a subsidiary of Niagara Hudson Power Corp., Buffalo, has approved plans for new steam-electric generating plant at Oswego, N. Y. Contract has been let for turbo-generator and boilers, and awards for other equipment will be placed soon. Cost about $9,500,000.

United States Engineer Office, Federal Building, Buffalo, asks bids until Sept. 26 for two bronze gear type pumps (Circular 29).

SOUTH ATLANTIC

Bureau of Yards of Docks, Navy Department, Washington, asks bids until Sept. 28 for extensions to structural and machine shops at Charleston, S. C., yard (Specifications 8853).

South Carolina Public Service Authority, Columbia, S. C., will take bids soon for five 40,000-hp. hydraulic turbines and accessories and one similar turbine of smaller capacity, with electric generators and other equipment for new hydroelectric generating plant for Santee-Cooper power and irrigation project. Financing has been arranged through Federal aid. Harza Engineering Co., 27 Cumberland Street, Charleston, S. C., is consulting engineer.

United States Engineer Office, Jacksonville, Fla., asks bids until Sept. 27 for two marine diesel engine units with reduction gear (Circular 95).

SOUTH CENTRAL

Auto Wheel Rim Service Co., 742 South First Street, Louisville, manufacturer of automobile wheels, etc., has asked bids on general contract for one-story plant at 826 Brook Street, 47 x 135 ft., with office unit adjoining, 40 x 47 ft. Cost over $45,000 with equipment. Present works will be removed to new location and capacity increased. Otto D. Mock, 314 Armory Place, is architect.

Louisiana Ice & Electric Co., Alexandria, La., plans new steam-electric generating station. Cost close to $425,000 with turbo-generator units and accessories, boilers, pumps and auxiliary equipment.

Davis & Andrews Co., Texas and Illinois Streets, Memphis, Tenn., plans rebuilding of grain elevator recently destroyed by fire. Loss about $70,000 with conveying, elevating and other mechanical equipment.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids for water-cooling system for air-conditioning system at Guntersville hydroelectric power plant; until Oct. 4, emergency gate for spillway regulating conduits at Hiwassee dam.

Abraham Brothers Packing Co., Memphis, Tenn., food packer and canner, has let general contract to Memphis Construction Co., 160 Union Street, for one-story addition, to

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increase present output about 50 per cent. Cost over $45,000 with equipment. Harry Hunter is engineer.

SOUTHWEST

Buck X-Ograph Co., 8709 X-Ograph Avenue, St. Louis, manufacturer of X-ray equipment and parts, has let general contract to Bumiller & Meyersieck, 3407½ South Jefferson Avenue, for two-story addition, 40 x 120 ft. Cost close to $50,000 with equipment.

City Council Guthrie, Okla., plans new municipal electric power plant and distributing system. Cost about $650,000. Financing will be arranged through Federal aid. Holway & Neuffer, 302 East Eighteenth Street, Tulsa, Okla., are consulting engineers.

Quartermaster, United States Army Department, Oklahoma City, Okla., asks bids until Sept. 26 for miscellaneous welding supplies (Circular 5808-11).

Board of Education, Salina, Kan., plans manual training department in new three-story senior high school, for which superstructure will begin this fall. Cost about $680,000. Financing has been arranged through Federal aid and bond issue. Benjamin H. Byrnes, National Bank of America Building, and Charles W. Shaver, United Life Building, are associated architects.

School of the Ozarks, Point Lookout, near Hollister, Mo., R. M. Good, president, has approved plans for three-story and basement canning plant, 62 x 112 ft. Cost close to $50,000 with equipment. Charles A. Smith, Finance Building, Kansas City, Mo., is architect.

Common Council, Perryton, Tex., plans new municipal electric power plant, with diesel engine-generating units and auxiliary equipment; also new waterworks pumping station. Cost about $160,000. Financing is being arranged through Federal loan and grant. E. T. Archer & Co., New England Building, Kansas City, Mo., are consulting engineers.

Anheuser-Busch Distributing Agency, Harlingen, Tex., affiliated with Anheuser-Busch, Inc., St. Louis, brewer, has leased one-story building, 60 x 240 ft., to be erected on local site by International Great Northern Railway Co., Houston, Tex., for storage and distributing plant. Cost over $60,000 with mechanical-handling, loading and other equipment.

WESTERN PA. DIST.

Dravo Corp., Neville Island, Pittsburgh, heavy equipment contractor, has leased property of Just Iron Works, White Plains, N. Y., for plant in connection with construction of shafts for new Delaware River Aqueduct for water department of City of New York, for which company has contract.

Wellsboro Electric Co., Wellsboro, Pa., plans expansion and improvements in steam-electric power plant, including new 1500-kw. turbo-generator unit, 400-hp. boiler and accessories, condenser and auxiliary equipment. Cost about $115,000.

OHIO AND INDIANA

Quartermaster Supply Office, Columbus General Depot, Columbus, Ohio, asks bids until Oct. 11 for 50 four-wheel, solid rubber tired warehouse trucks, and for 50 two-wheel similar trucks (Circular 1).

Board of Education, Lorain, Ohio, will ask bids on general contract in October for new two-story industrial arts school, 144 x 165 ft. Cost about $150,000 with equipment. F. J. McFadden, 442 Oberlin Avenue, Cleveland, is architect. W. A. Pillans is business manager for board.

Contracting Officer, Materiel Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Oct. 6 for propeller blades, propeller blade assemblies, propeller hub assemblies, etc. (Circular 151).

Nickel Plate Railroad, Terminal Tower Building, Cleveland, plans rebuilding four one-story repair and supply shops at terminal at Bellevue, near Cleveland, recently destroyed by fire. Loss over $40,000 with equipment.

Board of Education, Kenton, Ohio, plans manual training department in new three-story high school, for which bids are being asked on general contract until Oct. 14. Cost about $335,000. Financing has been arranged. Thomas D. McLaughlin & Associates, Lima, Ohio, are architects.

City Council, Crawfordsville, Ind., plans extensions and improvements in municipal electric light and power plant, including additional equipment. Cost about $146,000. Financing has been arranged through Federal aid.

MICHIGAN DISTRICT

Stamping Service, Inc., 4833 Beaubien Street, Detroit, manufacturer of metal stampings, has let general contract to Krueger Construction Co., 16623 Wyoming Avenue, for new one-story plant on East Davison Avenue, with office building adjoining. Cost over $40,000 with equipment.

Starling Aircraft Corp., Benton Harbor, Mich., recently organized to manufacture airplanes and parts, has leased plant of Heath Aircraft Co., for production of a new popular-priced monoplane, including parts manufacture and assembling. Engines for new plane will be secured from Ford Motor Co. Plant is expected to be ready for production in about 60 days. David M. and William V. Bailey, both Battle Creek, Mich., are president and vice-president, respectively; C. S. Biesmeir is chief engineer.

State Department of Public Buildings, Lansing, Mich., plans new steam-electric power plant and electrical distributing system at institution at Coldwater, Mich. Cost about $325,000 with equipment. E. R. Little Co., Inc., Ford Building, Detroit, is consulting engineer.

MIDDLE WEST

United States Gypsum Co., 300 West Adams Street, Chicago, has purchased large tract on Trout River, Jacksonville, Fla., for new mill, for which plans will be drawn at once. It will include power house, machine shop and miscellaneous buildings, with dock and waterfront facilities for unloading and distributing raw materials. Work is scheduled to begin this fall. Cost close to $1,000,000 with machinery.

Processed Steel Corp., Chicago, recently organized, has leased one-story building at 1143 West Thirty-sixth Street, about 10,000 sq. ft. of floor space, for plant.

Atchison, Topeka & Santa Fe Railway Co., 80 East Jackson Boulevard, Chicago, has let general contract to Holton Seelye & Co., 32 West Randolph Street, for one-story repair and maintenance shop, 110 x 325 ft., at division yards, Eighteenth Street and Wentworth Avenue, to handle diesel-type locomotives and streamlined coaches. Cost about $250,000 with equipment.

Constructing Quartermaster, Savanna Ordnance Depot, Savanna, Ill., asks bids until Sept. 26 for 21,000 lb. uninsulated copper cable, 5000 terminals and 500 cable taps (Circular 13).

City Council, Seymour, Iowa, asks bids until Oct. 4 for extensions and improvements in municipal electric power plant, including new diesel engine unit and auxiliary equipment. H. S. Nixon, Grain Exchange Building, Omaha, Neb., is consulting engineer.

Bureau of Reclamation, Denver, asks bids until Oct. 10 for three 11,500-hp. vertical-shaft, single-runner Francis-type hydraulic turbines, three oil-pressure actuator-type governors for turbine units, and three 9000-kva., vertical shaft electric generators, with direct-connected exciters, thrust and guide bearings, etc., for installation in Elephant Butte hydroelectric power plant, Rio Grande project, New Mexico-Texas; also for two 15,000-hp. vertical-shaft, single-runner Francis-type hydraulic turbines, with two oil-pressure actuator-type governors, and two 12,000-kva. electric generators, with exciters, thrust and guide bearings, etc., for installation in Green Mountain hydroelectric power station, Colorado-Big Thompson project, Colo. (Specifications 802).

Logemann Bros. Co., 3150 West Burleigh Street, Milwaukee, manufacturer of hydraulic baling presses for scrap metal, has plans by Eugene R. Liebert, local architect, for an erecting shop addition, 40 x 120 ft. Contracts will be placed at once.

Froedtert Grain & Malting Co., 3800 West Grant Street, Milwaukee, has announced expansion program costing $350,000, consisting of new grain elevator and malt storage tanks, workhouses and machinery, at main plant in Milwaukee and branch plant at Winona, Minn. Walter A. Teiple, Sr., is president and general manager.

Grant County Co-Operative Rural Electrification Association, Lancaster, Wis., has received REA allotment of $257,000 to build approximately 245 miles of line.

Board of Education, Richland Center, Wis., has plans for $113,600 vocational school and appurtenances designed by E. A. Steubenrauch, architect, 809 North Eighth Street, Sheboygan, Wis. Application has been made for PWA grant. Alfred Breeden is school board clerk.

PACIFIC COAST

Board of Education, 1151 South Broadway, Los Angeles, has authorized immediate call for bids on general contract for one-story two-unit vocational shop at Bret Harte Junior High School, 9301 South Hoover Street. Cost close to $40,000 with equipment. A. S. Nibecker is architect for board.

United States Indian Irrigation Service, Eighth and Figueroa Streets, Los Angeles, asks bids until Oct. 26 for two large centrifugal pumping units, with intake and discharge connections, bearings, drive shafts, etc., and for one additional centrifugal pump with accessories for Flathead River pumping station, Flathead Indian irrigation project, Mont. (Adv. No. 2).

Butler Packing Co., 879 South Eighty-eighth Street, Tacoma, Wash., food packer and canner, will take bids at once on general contract for new processing and packing plant at Seattle, one-story, 60 x 160 ft. Cost about $45,000 with equipment. Sutton, Whitney & Dugan, Rust Building, are architects, and Putnam Engineering Co., Provident Building, consulting engineer, both Tacoma.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 27 for one electric spot welder (Schedule 4325), one engine lathe (Schedule 4343), 1000 ft. of aluminum extruded shapes, 650 ft. of aluminum alloy rolled section shapes, and 140 ft. of aluminum alloy extruded shapes for aircraft (Schedule 900-2038); until Oct. 11, 30 acetylene gas cylinders (Schedule 4405) for San Diego Naval Air Station; until Sept. 30, 50 aircraft propeller power units (Schedule 900-2055) for Seattle yard; until Oct. 4, one electric furnace unit with control equipment (Schedule 4379) for Mare Island yard.

J. D. Ross, administrator, Bonneville project, Failing Building, Portland, asks bids until Oct. 4 for 250,000 ft. of copper cable and appurtenances for transmission lines (Circular 53), 350,000 ft. of copper cable and appurtenances for transmission lines (Circular 54).

FOREIGN

International Harvester Co. of Australia, Pty., Ltd., Melbourne, Victoria, Australia, has approved plans for new plant on 45-acre tract on Corio Bay, Geelong, near Melbourne, and will proceed with superstructure for one and multi-story units for production of farm machinery and equipment, including parts manufacture and assembling facilities. Cost about $2,500,000 with machinery.

John Brown & Co., Ltd., Atlas Works, Sheffield, England, operating a shipbuilding plant, has acquired plant and business of Westland Aircraft Works, Yeovil, Somerset, for new line of production. Westland plant will be expanded to double present capacity for parts production and assembling, including large output of military planes for British Government.